LADY JULIA PERCY ISLAND.

REPORTS OF THE EXPEDITION OF THE McCOY SOCIETY FOR FIELD INVESTIGATION AND RESEARCH.

2502.—11

Contents.

1. *General Introduction.*

By PROFESSOR F. WOOD JONES.

The McCoy Society for Field Investigation and Research came into existence in August, 1935. Its purpose is expressed in its title. Its beginnings were humble but its aims ambitious. Its success has been assured by the industry of its workers in the field and by the very gratifying financial help that has been so readily forthcoming from those who have seen in the birth of this Society the initiation of a movement that is destined, if continued upon the right lines, to accomplish work that is of the utmost importance in Australia. The study of the ecology of definite Australian environments is one that has utilitarian, as well as scientific, value. This aspect has been appreciated by many friends of the Society and it is owing to their generosity that the work, so far accomplished, has been made possible.

For the first season's work Lady Julia Percy Island was chosen as being a small, self-contained, and readily accessible sample of the Australian environment. The island was one upon which, with the Society's somewhat slender funds, a camp could be maintained for a period of some two months. But although Lady Julia Percy Island is of limited area and of not very difficult access, it proved to be by no means a typical sample of the insular environment of the southern shores of Australia. By a strange chance the Society had selected as its first field for investigation an area possibly unique among the offshore islands of our South coast. Lady Julia Percy Island proved to be a pure volcanic mass uprisen in the sea, and not, as are the general run of offshore islands of the South Coast of Australia, a part of the old continental mass sundered from the mainland. Herein lay the interest of the first season's work. For the geologists there was the problem of an isolated volcanic mass that has almost certainly never been connected with the mainland of Australia. For the agriculturalist the problem of a purely volcanic soil with its attendant peculiarities of chemical composition and soil bacteria. For the biologists there were the problems of the arrival, and survival of plant and animal life in a peculiar environment to which each must come as a waif by some chance or other. And finally there is the question of weaving all the problems into a whole fabric so that we may come nearer to understanding the reactions of all the factors of an environment, organic and inorganic, the one towards the other.

A definite contribution towards this understanding was made by the members of the McCoy Society in its camp on Lady Julia Percy Island. But, although the generosity of many friends had made the work on the island possible, little would have been gained if this work had been destined to remain chronicled only in the note books of the various members of the Society. It is due entirely to the vision and generosity of Messrs. G. and A. M. Nicholas that publication of our initial efforts has been made possible.

The papers included in the present publication are to be regarded merely as a first contribution. Several major questions, of vital importance to Australia, remain for discussion. The problem of the introduced rabbits and the question of their control may well be put to the test on this island. The question of the influence of a colony of seals upon the fishing industry is capable of some solution, if the data collected by the Society are placed upon record. In the papers that are here published there is no more than a record of the work of various members of the Society. Their findings are permanent records of the state of the island ecology as it was at the time of their visit. The McCoy Society has established one landmark—it has recorded, as completely as possible, the state of the balance of nature in Lady Julia Percy Island in the summer of 1935-1936. This is only a beginning—a beginning made possible by individual enterprise and by individual generosity. It would be encouraging if it might be assumed that in the not far distant future the Society should not seek its funds from private individuals, generous though they have been, but that it should be relieved of financial worries by definite grants made from research funds administered by some corporate body.

2. *Historical Introduction.*

By D. J. MAHONY, M.Sc.

Early in the year 1800 Lieutenant James Grant sailed from England for Sydney in command of H.M. armed surveying vessel *Lady Nelson,* 60 tons. At Cape Town he received orders to proceed through the Strait lately discovered by Bass separating Tasmania from the mainland, and to examine the coasts on both sides of this passage. Grant in his unpublished journal made the following note (quoted from *The Portland Bay Settlement* by Noel F. Learmonth) :—

> "Dec. 6, p.m. At three made a considerably large island, high and inaccessible on all sides. We had an opportunity of seeing, apparently, a good soil with grass on it, but no trees. This I named Lady Julian's Island in honour of Lady Julian Peircy."

Grant's chart of the north and west parts of Bass Strait gives the name as Lady Julia Percy's Island. Ida Lee, in *The Logbooks of the Lady Nelson,* reproduces Governor King's "eye sketch" made in 1800 from Grant's report, and here the name is Lady Juliana's Island. Flinders' chart of Terra Australis, 1802, shows "Lady Jul. Percy's I., a cliffy, flat-topped isle."

Nicholas Baudin sighted the island on 1st April, 1802, and described it as "entièrement dépourvue d'arbres et semble n'être couverte que par une espèce de bruyère très peu élevée" treeless and seemingly clothed only with low-growing broom (or heath). Sixty years later, A. C. Allan, the surveyor, wrote in an official letter that "the whole island is covered with low, thick scrub, rushes and creepers, and the [trigonometrical] station being situated on the opposite side from the landing, great delay was experienced in moving up the observatory and instruments to the station." At the present time no trace of scrub remains.

Within a few years of the discovery of Bass Strait, sealers had visited every rock and island in it, and as far west as Spencer Gulf. Seals were ruthlessly slaughtered and almost exterminated; as early as 1807, Surgeon Luttrell writing from Sydney, said that sealing was greatly on the decline as nearly all the seals on the islands of the southern coast had been destroyed or had abandoned the islands in consequence of depredations by sealers. Sealers apparently made no permanent settlement on Lady Julia Percy Island, but two were buried there, one in 1822 and the other in 1828.

On two occasions the island was used as a site for trigonometrical stations during extensive surveys. In 1840 A. J. Tyers used a station on the eastern point of the island during his survey of the coast between Melbourne and the Glenelg River. While the geodetic survey of Victoria was in progress, A. C. Allan used a trigonometrical station near the southern end of the island in 1863 and built a cairn 8 feet high over the marked stone which indicates the spot. Neither of these surveyors mapped the island.

Prior to 1876 a deposit of guano in a cave at Sealers Cove was exploited, but little was obtained and work was soon abandoned. Between 1879 and 1908 various applicants were granted grazing licences. Pig breeding was tried about 1884, but was not payable and the pigs were allowed to run wild; about 50 years ago they were rounded up by local fishermen and shipped to Melbourne.

Mr. E. C. Griffiths, formerly of Port Fairy, has supplied some interesting information. His father, Mr. J. Griffiths, released a pair of ordinary grey rabbits and some guinea fowl on the island in 1868. In 1886 the Government decided to establish an emergency station for castaways, and Mr. Griffiths and his father carried out the work in that year, spending about three weeks on the island. At that time there was a patch of dense tea-tree scrub near the southern end of the island and the rest was covered with bracken, grass and rushes. Pigs and a horse taken to the island by former occupiers had run wild. Rabbits were abundant and some guinea fowl had survived. Seals, penguins and quail were there in great numbers, but no mutton birds. The wooden tramline that had been used to take guano from Sealers Cove to the landing place had fallen into decay and all the guano had been removed.

3. *Topography and Physiography.*

By IRENE E. DEWHURST.

As the island is entirely volcanic in origin, its surface physiography is controlled by the later lava flows. The nearly horizontal disposition of these flows has determined the low, flat-topped nature of the island, the heights ranging from 105 feet at the lowest (northern) end to 152 feet at the highest (southern) end. No definite drainage system has developed. Depressions in the surface, such as the area known as "The Swamp," may be due to the collapse of lava tunnels in the underlying basalts, while the land to the south is relatively higher owing to the proximity of the centre of eruption, where a greater accumulation of volcanic material in the form of scoria and tuff occurred. Apart from a ridge half a chain south of the camp, and that east of Cairn 2, formed by the edge of the sixth and last lava flow, which only partially covered the previous one, there is no land form to break the monotonous flat top of the island.

Coastal features.

The coast line, in general, is extremely rugged, including many small bays and projecting headlands, and the island is surrounded by nearly vertical cliffs which are due directly to undermining of the rock faces by wave attack, and collapse of the upper sections.

With the exception of the south-western portion of the island in the vicinity of Horseshoe Bay, where there is solid basalt, the rock at water level is the boulder tuff, which is readily eroded.

The caves in general extend inland, normal to the cliff face. In bays, the force of the waves is concentrated in the corners, where caves are formed, as shown by Seal Cave, near McCoy Platform, and the caves in Horseshoe Bay. The Fern Cave and Guano Cave in Seal Bay, which are now 15 feet above sea level, may represent the remnants of normal caves developed before the formation of Seal Bay, the later accumulation of shingle, and, in the case of Fern Cave, landslip material, blocking the lower part of their entrances and thus rendering them inaccessible to the waves.

Where the junction of the boulder tuff with the solid basalt flows above is less than 40 feet above sea level, the cliff profiles are modified by the development of storm wave nips at this junction. Examples of these are found in the cliff profiles of all the headlands south of Cape Frederic and at Dinghy Cove and Sphinx Head. At the west end of the island, where the cliffs consist of solid basalt, however, no nip is developed.

Several scoriaceous reefs occur at the heads of the bays, Square Reef and Delta Reef being the largest. These are associated with the general processes of marine erosion, and are remnants of typical shore platforms. Square Reef is approximately 20 square chains in area and rises from 5 to 6 feet above low water level.

McCoy Platform, at the north head of Seal Bay, is an example of a wave-cut platform. This comprises a ledge, 25 to 30 feet in height, of relatively harder rock which has resisted marine attack during the denudation of the upper portions of the cliff by storm waves (see Figs. 1 and 2). With regard to these

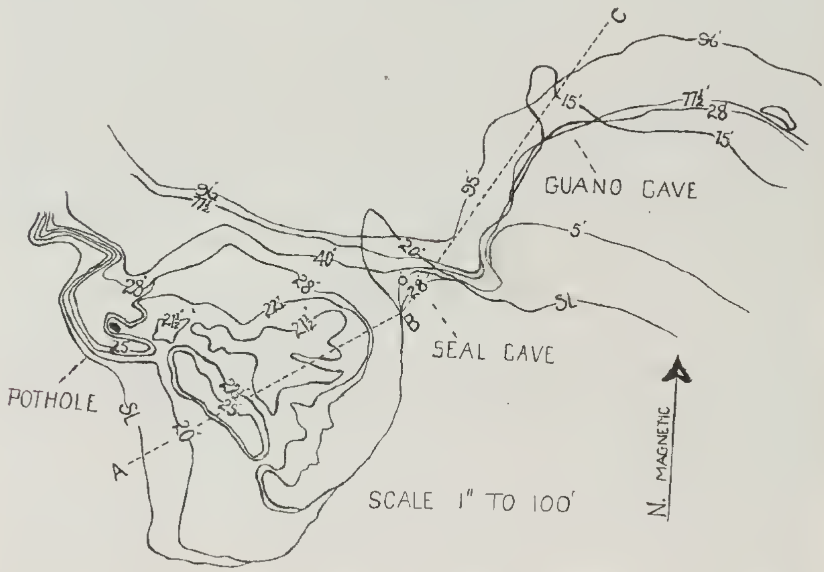


Fig. 1.—A detailed contour map of McCoy Platform and a westerly portion of Seal Bay, locating the pothole (in black) and Seal and Guano Caves (from survey by L. W. Stach).

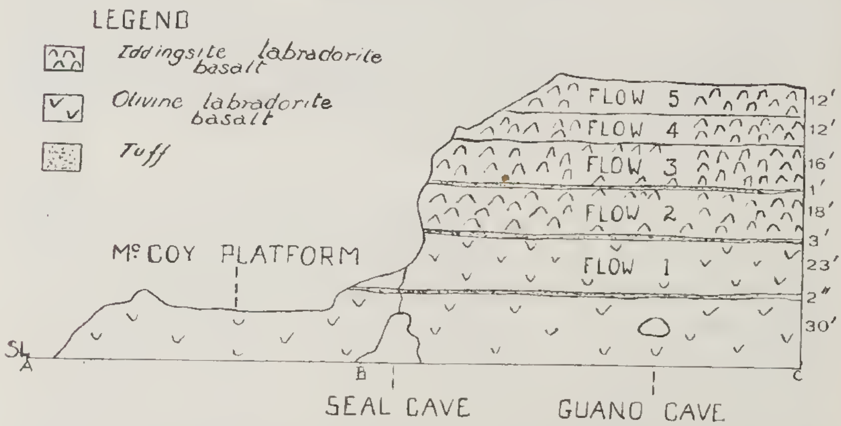


Fig. 2.—Section through McCoy Platform, Seal and Guano Caves. Types and thicknesses of the various volcanic phases are indicated.

waves, it may be stated that the effect of tides on the waters in the vicinity of the island is negligible, being entirely subsidiary to the banking up of water on the windward side of the island by the wind.

The centre of eruption of the later volcanic series now forms a physiographic feature in the form of a volcanic neck of dense columnar basalt constituting the headland, Pinnacle Point.

Talus fans are to be found at Landslip Point and in Dinghy Cove, where they rest at an angle of 27 to 30 deg. against almost vertical cliffs. These are products of the normal atmospheric weathering of the cliffs.

Shingle beaches, formed by wave attack on the material of the talus fans, are found at the head of some bays, as illustrated by the seal beaches in the vicinity of Landslip Point and the beaches in Dinghy Cove and Seal Bay. Drift materials from the mainland and from the sea floor between the island and the mainland also collect here as very much rounded, and frequently bun-shaped pebbles of rock types not found on the island.

4. *General Geology.*

By LEO. W. STACH, B.Sc.

The island is entirely composed of volcanic rocks, and appears to have been developed during two successive periods of vulcanicity. The earlier volcanic outburst resulted in the development of the so-called boulder tuff together with flow 1, which are seen in section in the cliffs of the northern half of the island (Plate XIX., Fig. 1). The boulder tuff dips southward, its top being 60 feet above sea level at Cape Frederic, and 30 feet above sea level at Sphinx Head.

It consists of large ellipsoidal lava boulders up to 2 feet in their shorter diameter, and often showing concentric flow ridges, embedded in a matrix of fine yellow tuff and larger scoriaceous fragments averaging about 2 inches in diameter (Plate XIX., Fig. 2). Passing along the west coast from Dinghy Cove, there is a gradual diminution in the proportion of matrix until in the vicinity of McCoy Platform the boulder tuff is replaced by ropy lavas (Plate XX., Fig. 3), while further west, in Seal Bay, the ropy lava is replaced by denser basalt.

Succeeding the boulder tuff is a flow of basalt varying from 6 feet in thickness at Dinghy Cove to 23 feet at McCoy Platform. Petrological examination has shown both the boulder tuff and the succeeding flow (Flow 1) to be olivine-labradorite-basalt. At Pinnacle Point this volcanic series ends abruptly at the vent which initiated the later period of vulcanicity. No evidence of a vent which could have given rise to the earlier series was observed on the island.

Along the west coast, overlying flow 1, is a tuff varying in thickness from 2-6 feet until, on both sides of the neck of Pinnacle Point, it passes into a tuff cone about 30-40 feet in height, where it forms the lip of the crater from which the later flows were extruded (Plate XX., Fig. 4). The proportion of scoriaceous fragments in the tuff increases with proximity to the cone. At Landslip Point no scoriaceous fragments occur, but at McCoy Platform, there is a large proportion of fragments 2 or 3 inches in diameter.

At the head of Horseshoe Bay large ejected lava blocks, several feet long, are seen in the tuffs, which, in the cone itself, consist of thin layers varying in their resistance to weathering, indicating numerous short explosive outbursts. The remainder of the cone must have extended to the west of Pinnacle Point, and it appears probable that the tuff cone was breached only on its eastern side, thus giving rise to the later flows (2-6), while the unbreached (western) side of the cone has disappeared as a result of marine attack.

Overlying the tuff is a succession of lava flows (Flows 2-6), which petrological examination has shown to consist of iddingsite-labradorite-basalts. In the cliffs of the western coast from Cape

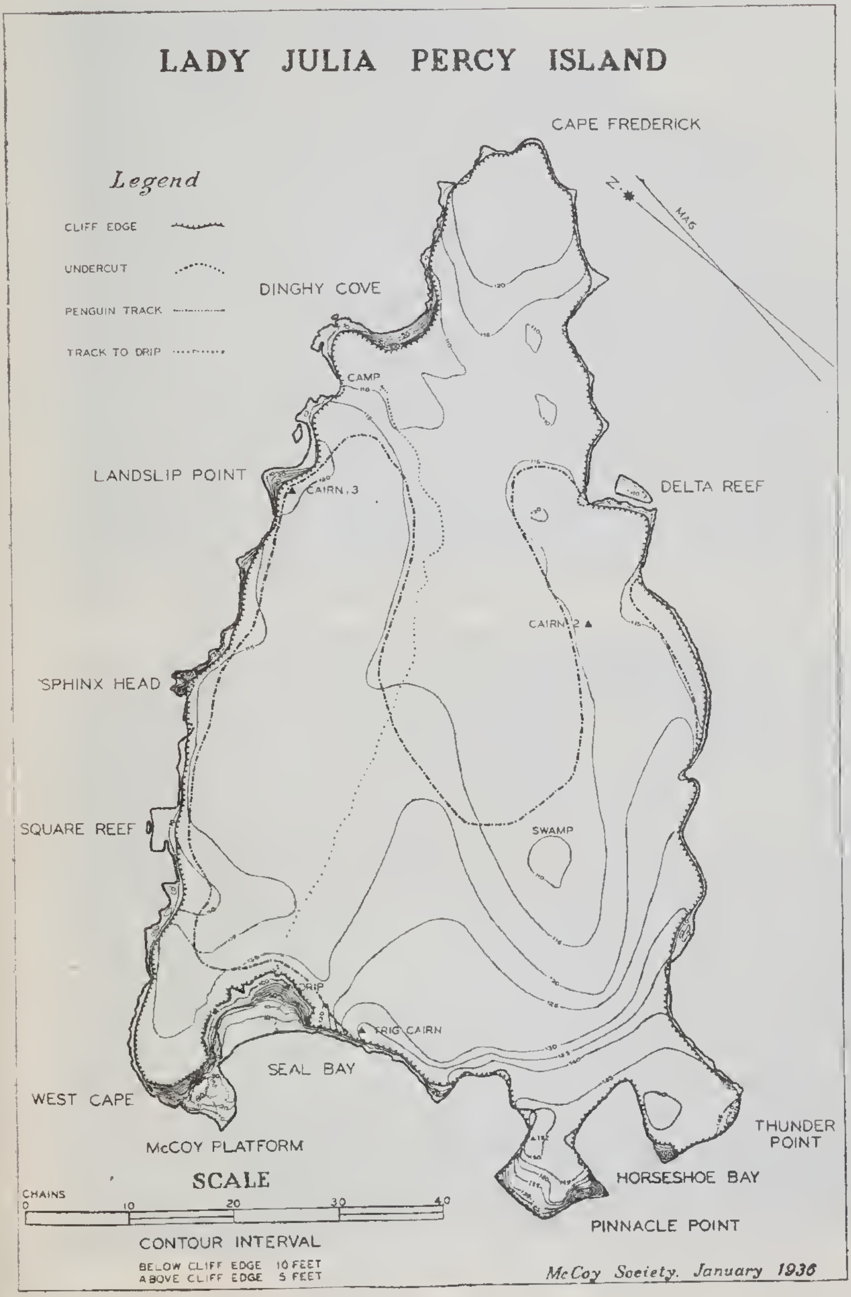


Fig. 1.—Map of Lady Julia Percy Island (from survey by L. W. Stach), showing boundary of the latest iddingsite-labradorite-basalt flow (Flow 6), indicated by an alternate dot-dash line.

Frederic to Seal Bay only four of these flows are seen in section, but in the headland south of Delta Reef, and in the cliff sections about 20 chains south of Delta Reef, a fifth iddingsite-labradorite-basalt is present. These flows vary in thickness from about 8-18 feet. In section, they are demarcated by the distribution of the gas cavities, the base of each flow being usually moderately vesicular for about 6 inches, while the upper 2 feet becomes increasingly vesicular to the surface. The central portions of the flows are very dense, but they are traversed by occasional long, slender, vertical, cylindrical pipes of vesicles.

The last flow (Flow 6) only partially covers the preceding flows, and extends from the vicinity of the vent in two tongues. One tongue passed to the Trig. Cairn and then south almost to the Camp, but does not extend to the cliff edge; the other followed the east coast as far as Delta Reef, but failed to reach the cliff edge along the depression below the 115 feet contour east of Cairn 2 (Fig. 1).

The actual pinnacle which forms the western headland of Horseshoe Bay consists of very dense resistant columnar basalt at its base and represents portion of the throat of the vent which initiated the later period of vulcanicity (Plate XX., Fig. 4).

Between some of the iddingsite-labradorite-basalt flows, thin bands of tuff occur, indicating short explosive outbursts between periods of effusive vulcanicity.

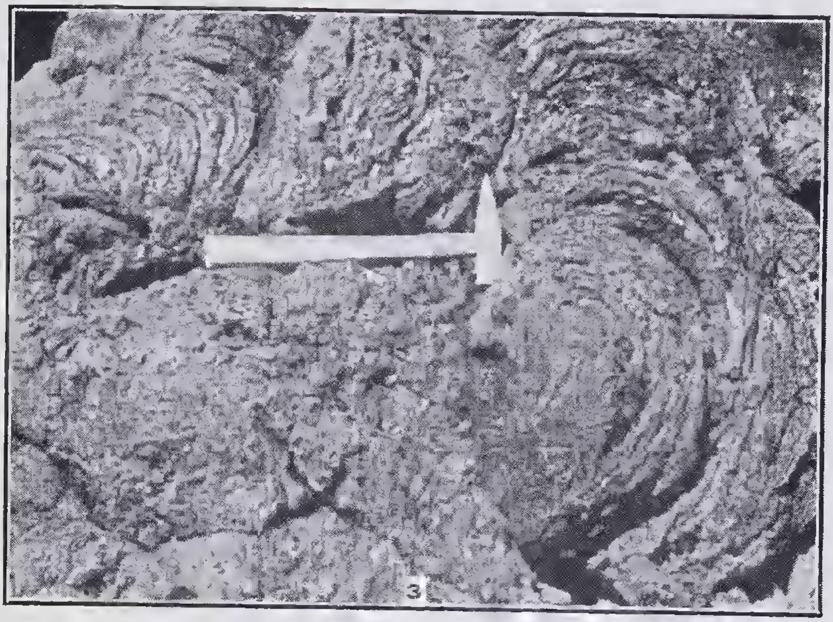
The island rises abruptly from depths of 20-25 fathoms at the southern end, while at the northern end, a long reef at a depth of 9 fathoms continues the foundation of the island, and then passes down to depths of 20-25 fathoms. The northern reef appears to be connected with the earlier period of vulcanicity. The isolation of the island from the mainland by deep water suggests that the island has developed quite independently as a result of submarine volcanic activity, and the presence of the vent producing the later flows supports this view. Further evidence of this is provided by the extreme paucity of the terrestrial vertebrate fauna, represented by one small species of lizard, whose accidental introduction by man seems beyond doubt.

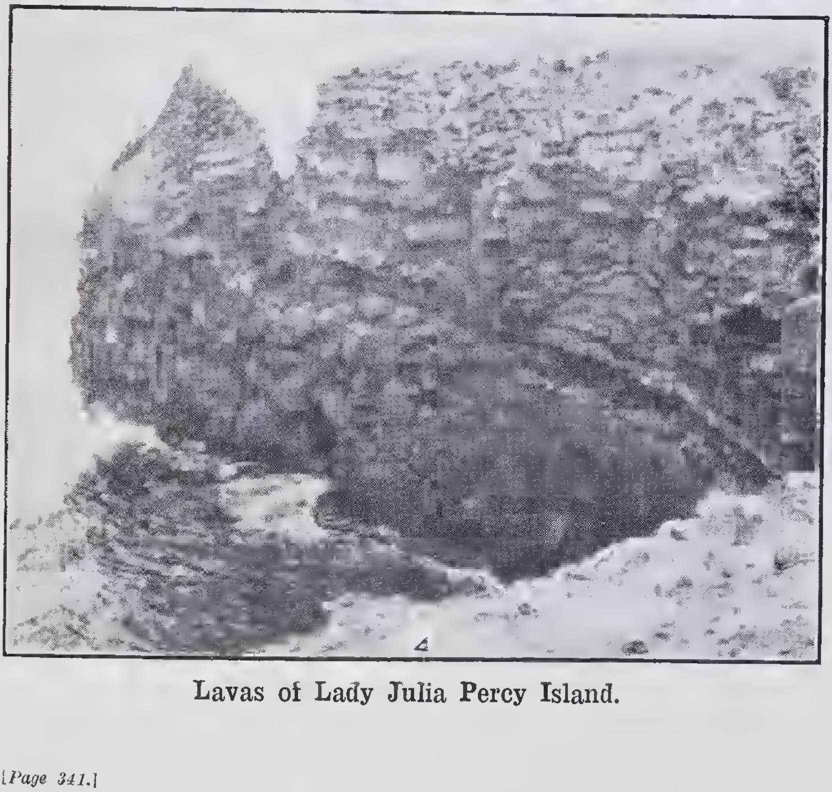
The absence of a definite surface drainage system, shallowness of the soil, and the generally extremely youthful surface physiography, suggest an age correlation with the unmodified volcanic areas of the Western District, such as Tower Hill, Koroit, which is regarded as not older than Upper Pleistocene.

Drift Material.—Amongst the locally-derived basalt pebbles of the shingle beaches of the western coast, numerous pebbles of rocks foreign to the island are found.

The most numerous of these are nodules of flint. In the hand specimen, indeterminate remains of Bryozoa can be seen in section, and the nodules have the white, calcareous, granular,

Lavas of Lady Julia Percy Island.





Lavas of Lady Julia Percy Island.

outer crust, typical of those found in the Miocene bryozoan limestones, outcropping along the western coast of Victoria, from which they cannot be distinguished. Occasional fragments of bryozoan limestone also occur.

Sporadic pebbles of porphyry, similar in type to the red-brown porphyries of Grange Burn Creek, Hamilton, also occur. At Hamilton these porphyries are directly overlain by the Lower Miocene marls and bryozoan limestones. It is therefore not improbable that similar relations occur on the sea floor between the island and the mainland.

Guano was taken some years ago from the Guano Cave in Seal Bay, where it apparently formed a deposit about 10-15 feet thick, almost completely filling the cave. Samples taken consist of a brown crystalline powder, analysis of which showed a high percentage of calcium phosphate with small amounts of iron and CO_2.

Explanation of Plates.

Plate XIX.

Fig. 1.—Cliff section 5 chains south of Dinghy Cove, showing boulder tuff and overlying basalt flows.

Fig. 2.—Detailed view of boulder tuff and matrix 3 chains south of Dinghy Cove.

Plate XX.

Fig. 3.—Ropy basalt on the seaward slope of McCoy Platform.

Fig. 4.—The tuff cone and vent initiating the later vulcanicity, seen in section on the western side of Horseshoe Bay.

5. *Petrology.*

By EUPHEMIA A. McIVER, B.Sc.

The rocks of Lady Julia Percy Island fall into three main groups, viz.: (*a*) the volcanic rocks of which the island is entirely built up, (*b*) the drift material which occurs as well rounded pebbles in the shingle, and which has probably been derived from the sea floor between the island and the mainland, and (*c*) tektites.

A. Volcanic Rocks.

The sequence established in the field is as follows:—

3. Iddingsite-labradorite-basalt, comprising flows 2-6, over 80 feet thick.

2. Olivine-labradorite-basalt, flow 1, 10-20 feet thick.

1. Boulder tuff, 30 feet thick.

Thin and irregular bands of tuff occur between the successive flows in most cases.

1. Boulder Tuff.

The boulders consist of comparatively thick tachylytic shells grading inwards into a dense basalt. The outer margin of the tachylytic shell contains a few large olivine phenocrysts with numerous small olivine crystals and plagioclase laths in a groundmass of green-brown glass, the latter constituting about 80 per cent. of the rock. No magnetite occurs. The plagioclase is labradorite (Ab_{38}). Two generations of olivine may be distinguished, an older group consisting of large crystals very much corroded around the edges and along cracks so that often a mere skeleton remains (Fig. 1B), and a younger group of small olivine crystals with well preserved crystal boundaries (Fig. 1B).

Towards the centres of the boulders the olivine and felspar crystals increase in size and number, the olivine is often iddingsitized along its margins, and the glassy groundmass contains abundant magnetite globules which tend to segregate around the margins of vesicles and in clots throughout the glass (Fig. 1C), showing that the magnetite has begun to crystallize at a late stage. This material resembles the iddingsite-labradorite-basalt (Footscray type), described by McInerny (1929).

The fact that iddingsite occurs in the inner zones while it is absent nearer the surface of the boulders, shows that the rate of cooling has been an important factor in its production: the cooling near the surface has been sufficiently rapid to prevent both the oxidation of the iron in the olivine and the introduction of more iron, two important reactions in the formation of iddingsite.

The matrix of the boulder tuff is a tuffaceous material composed chiefly of small fragments of tachylytic basalt, brown glass, halloysite, and ash.

The tachylytic and ropy lavas contain abundant amygdules completely or partly filled with calcium carbonate, in the form of mammillary calcite with concentric colour bands, "nail head" crystals of calcite or aragonite, generally as aggregates of radially arranged acicular crystals.

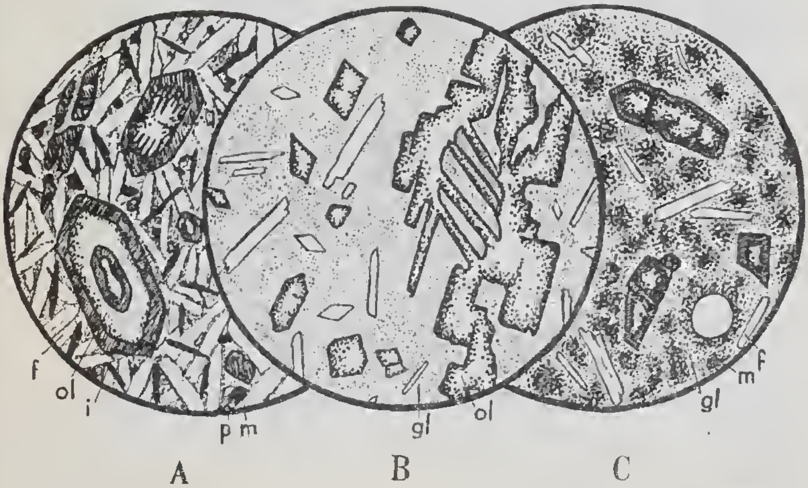


Fig. 1.—A. Iddingsite-labradorite-basalt; B. Tachylyte from Boulder Tuff; C. Tachylyte from Boulder Tuff; f—felspar, ol—olivine, i—iddingsite, p—pyroxene, m—magnetite, gl—glass.

2. Olivine-labradorite-basalt—Flow 1.

This is a medium-grained basalt in which large phenocrysts of olivine occur in a groundmass of felspar laths (labradorite), purplish-grey titanaugite, iron ores—mainly ilmenite in the form of grains and rods—a little olivine, and abundant greenish-brown glass. There has been no iddingsitization, but partial resorption of olivine has occurred. The glass is free from iron ore, showing that the latter has crystallized at an early stage and that its crystallization was complete before the glass solidified.

3. Iddingsite-labradorite-basalt—Flows 2-6.

The five later flows possess the same general characteristics. They are medium in grain, and contain abundant phenocrysts of olivine which show no signs of corrosion, but are iddingsitized either completely or round their margins and along cracks. In some cases the junction between the iddingsite and the olivine core is fibrous (Fig. 1A). Occasionally a core of olivine is surrounded by iddingsite, followed by a zone of olivine, and finally by an outer zone of iddingsite, indicating an alternation in olivine and iddingsite-forming conditions (Fig. 1A). There are no pyroxene phenocrysts. The groundmass consists of laths of labradorite (Ab_{37}), small grains of greyish-green augite, irregular patches of iddingsite after olivine, and grains and rods of iron ores.

Flow 6 includes small, approximately spherical patches of coarser grained basalt, containing no olivine, and surrounded by well defined rings of partly resorbed minerals. These are probably xenoliths.

At Landslip Point, just above the level of Flow 1, a band of tuff, about 4 feet thick, occurs. This is traversed by narrow vertical sheets of denser resistant material. Microscopic examination of the denser material shows it to be a fresh basalt with all the characteristics of the iddingsite-labradorite-basalts described above, and that there has been no introduction of secondary materials from solutions. The flow 2 basalt has therefore filled cracks in the tuff between flows 1 and 2.

4. Tuff.

The tuff bands are all of the same general character, consisting of fragments of tachylytic and crystalline basalt and green-brown glass, often sub-angular or rounded, in a yellow matrix of ash and halloysite. The various tuffs differ only in the percentage and size of the included fragments. At Thunder Point, the scoria show partial replacement by calcite, while the tuff which forms the matrix, and through which solutions have been able to pass more readily, has been very extensively replaced.

Secondary rocks, whose formation has been associated with the weathering of the basalt, include buckshot gravel and clays, with varying percentages of iron. These are developed in small quantities on the surface of the island, and consist of abundant small nodules of limonite in an earthy matrix ranging from a deep red brown material rich in iron, to a creamy-white bauxitic material. These rocks probably result from decomposition of basalt near the surface and introduction of hydrated oxides derived from the underlying basalt by ground water, and brought to the surface by capillarity during dry periods.

B. Drift Material.

This is most abundant in the shingle of Dinghy Cove and Seal Bay. The following rock types were recorded:—

1. Spherulitic felspar porphyry.

Large phenocrysts of red orthoclase, spherulites and green biotite largely replaced by chlorite and magnetite, occur in a fine grained groundmass of felspar, biotite and magnetite. The nature of the spherulites varies; some, probably those formed first, are perfect in shape, and no microliths can be distinguished, while others containing radiating microliths of a black mineral, probably iron ore, often surround a felspar crystal as nucleus and invariably have irregular boundaries due probably to their formation being at a later stage than the former type (Fig. 2B).

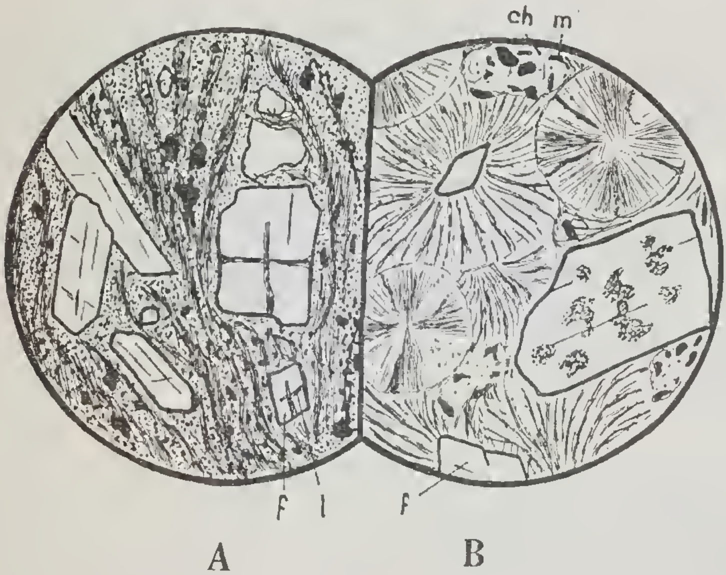


Fig. 2.—A. Felspar porphyry; B. Spherulitic felspar porphyry; f—felspar, l—limonite, ch—chlorite, m—magnetite.

2. Felspar porphyry (Fig. 2A).

Large phenocrysts of orthoclase, often saussuritized, and abundant magnetite grains occur in a groundmass which shows definite flow structure, and which has been largely replaced by hematite. Hematite has also been introduced along the cleavage cracks of the felspar phenocrysts. Where lenticular patches of unreplaced groundmass occur the latter is seen to be very fine grained and to consist of felspar, quartz (?), chlorite and magnetite. The hematite imparts a dark purplish-red colour to the rock.

3. Granophyre.

This is a light grey rock consisting of granophyric intergrowths of quartz and orthoclase, much magnetite and chlorite replacing biotite and preserving in general the fibrous structure of the latter, and individual crystals of quartz and of saussuritized felspar.

4. Foraminiferal limestone.

This is buff in colour, and consists entirely of crystalline calcite and tests stained with limonite. Under the microscope numerous tests of Foraminifera, of which *Globigerina, Cibicides* and *Textularia* are the most abundant, were distinguished.

5. Flint.

Abundant large irregular nodules of grey flint with a white calcareous crust form the bulk of the drift material.

C. Tektites.

Two tektites (Australites) were found in the vicinity of Square Reef. As australites have been recorded from several areas in south-eastern Australia and are particularly abundant in a zone extending from Portland on the west to Warrnambool on the east, their occurrence on Lady Julia Percy Island, which falls within the limits of this zone, is to be expected. The finding of only two specimens is probably due to the fact that the growth of bracken rather than a sparse distribution prevents their detection. The fact that both specimens are rather worn suggests that their occurrence is not particularly recent. Their specific gravity falls within the normal range, which varies from about 2.3 to 2.6.

Detailed Description.

Specimen 1. Univ. Coll. No. 3023.

Classification.—This is referred to the button type, as there still remains approximately one-tenth of the flange. The rim is well defined; diameter 1.40 cm.; thickness 0.78 cm.; specific gravity 2.44. Anterior surface; this side shows two well-defined concentric flow ridges, and within the smaller of these, in a sub-central position, occur flow grooves. Posterior surface; this is closely pitted and near the margin shows distinct flow lines.

Specimen 2. Univ. Coll. No. 3024.

Classification.—As the diameter of this specimen varies slightly, the maximum being 1.30 cm., and the minimum being 1.13 cm., it tends toward the oval type rather than the true lens. The rim is well defined, and there is only a very small remnant of the flange; diameter, minimum 1.13 cm., maximum 1.30 cm.; thickness, 0.68 cm.; specific gravity, 2.52. Anterior surface; there are two concentric flow rings. Posterior surface; fairly close pitting occurs, and in one area near the rim there are two short flow grooves. Under the lens numerous flow lines are distinguishable.

Reference.

McInerny, Kathleen, 1929. The Building Stones of Victoria, Part II., The Igneous Rocks. *Proc. Roy. Soc. Vic.*, n.s., xli. (2), 1929, pp. 121–159.

6. *Vegetation.*

By A. G. EDMONDS.

Soil.

The soil is black and very rich in organic matter, but exceedingly shallow. It is loamy in texture, excellently drained, and apparently quite fertile. It is of slightly acid reaction. Detailed analyses are given in section 7.

Rainfall.

The rainfall may probably be taken as approximately equal to that of the neighbouring mainland (30 inches approximately) with reliability of about 15% average variation from the mean.

Wind.

During our short stay, the island was continually under the effects of either north, south, or south-east winds, varying in intensity from mild winds to most intense storms, during which spray was blown over the island.

The effect on growth is twofold. Firstly, winds promote the loss of moisture from the plants and the shallow loamy soil. The significance of the latter is complicated by added moisture as spray, and the relatively high percentage of soil colloids. Secondly, it has a very great inhibiting physical effect on the growth of vegetation.

Vegetation.

Vegetation found on the island can be divided into six communities:—

(1) Grassland.
(2) Fernland.
(3) *Senecio* association.
(4) Seasonal swampland.
(5) *Mesembryanthemum* association.
(6) Celery society.

The time of our stay was a very dry one. There were no shrubs or trees to be found on the island, nor would they be expected, as the constant high winds; together with the shallowness of the soil on this high and most exposed place, would surely inhibit all such growth.

Grassland.

This constitutes about a third of the area, the predominant grass being *Calamagrostis filiformis* ("blown grass"), a grass of little flag and short thin leaves. Ewart, in his Flora of Victoria, gives it as "A common, glabrous, short-lived perennial, drying off in the summer, being a good fodder plant."

Aira caryophyllea (silvery hair grass) was fairly common, and formed, together with the blown grass, a mat of dried inflorescences over the surface.

Briza minor (shell grass) was recognized only from empty inflorescences. It was sparse.

Other plants present were *Anagallis arvensis* (scarlet pimpernel) and *Erythraea spicata,* one plant of which was found.

The absence of forms such as *Danthonia* and *Stipa,* prevalent on the mainland, is indeed singular.

Fernland.

This covers about one-third of the island, consisting of a practically pure and very dense colony of dwarfed (12–18 inches) plants of *Pteridium aquilinum* (bracken fern).

The rhizomes were set very deep in the soil, and their decay possibly accounts for the high humus content of the soil. It may be that there is a fluctuating balance between grassland and fernland. *Calamagrostis filiformis* was found in association in places. Other plants recorded were *Juncus pallidus* (rare) and *Juncus bufonius* (very rare). The fernland is the chief location for rabbit burrows.

Senecio Association.

This covers an extensive area, mainly on the west of the island in the vicinity of the rookeries. It also is inhabited by rabbits. Its chief constituent was *Senecio lautus* which is widespread in Victoria, being usually found on sandy loams. *Calamagrostis filiformis* was also present, and *Carduus pycnocephalus* (shore thistle) had also been introduced in some parts from the mainland.

Seasonal Swampland.

A small patch of swamp occurs in the middle of the island, and is much frequented by rabbits. The association consists almost exclusively of *Chenopodium glaucum,* but *Anagallis arvensis* is prevalent on the edges. This is reported as a poisonous weed usually avoided by stock. It contains saponin, but is readily eaten by the rabbits.

Mesembryanthemum Association.

This is restricted to the south of the island, and enjoys better drainage. Dead patches of this plant may probably account for the high humus content of the soil in other parts.

No reason for the death of this *Mesembryanthemum* could be seen. The sole constituents were *Mesembryanthemum aequilaterale* and *Dichondra repens.*

Celery Society.

A small patch of *Apium australis* (sea celery) was found at the south end of the island.

Fig. 1. Vegetation Survey Map of Lady Julia Percy Island.

7. Soil.

By A. G. EDMONDS.

Mechanical Analysis.

The soil is of a very shallow (6 in.–24 in.) and rocky nature. The texture of the soil in the main is, as indicated in the table below, that of a fine sandy loam. The swamp soil, however, is much heavier.

Gravel was found throughout the soil, and in parts covers the surface. Forming not more than 5 per cent., this gravel consists of partially decomposed basalt rock in the main, but also includes some concretions of hydrated ferric oxide (buckshot) distributed in depth.

Table.—Mechanical Analysis of Soils of Vegetation Types.

—	Fernland.		Grass-land.	Seasonal Swamp-land.	Senecio Association.	Mesembryanthemum Association.		
Horizon (depth in inches) ..	0–8.	8–11.	0–6.	0–8.	0–14.	0–9.	9–18.	18–22.
Soil Colour.	Black.	Dark Brown.	Dark Grey.	Light Grey.	Black-brown.	Black.	Dark Brown.	Red Brown.
	%	%	%	%	%	%	%	%
Coarse sand < 2·0 mm. .	20·6	24·2	17·2	5·4	24·6	18·7	28·8	7·9
Fine sand < ·2 mm. ..	30·4	26·8	20·8	21·9	22·1	28·3	28·1	26·1
Silt and clay < ·02 mm. ..	18·4	20·5	37·4	55·1	24·9	28·1	27·0	55·0
Moisture ..	12·5	11·2	12·6	6·4	14·3	14·6	14·0	11·0
Organic matter ..	18·1	17·3	12·0	11·2	14·1	10·3	2·1	..
Reaction pH ..	5·7	5·7	4·8	5·2	5·5	6·0	6·5	6·7

The table shows the soils to be on the acid side of neutrality with a pH range of 4.8-6.7. The only soil on which *Azotobacter* grew well was the *Mesembryanthemum*, which has a pH 6.0-6.4, though this difference may be due to the different mineralogical compositions of the soil as much as to pH.

Organic Matter.

The organic content of the soil was particularly high in all samples, due presumably to very good plant growth. Plants were not growing, however, at our time of visit. The specific nature of the flora might also assist in accounting for the high percentage of organic matter.

Fine Sand Minerals.

A microscopic analysis of the fine sand fractions, kindly made by Miss Ann Nicholls, showed magnetite to be extremely abundant, constituting about 50–75 per cent. of the minerals. Augite, plagioclase, and olivine were common, being in the form of fresh, irregular crystals.

Quartz, found as round grains, was fairly scarce, constituting about 10 per cent. of the sand fraction. The presence of the quartz is apparently the result of wind-blown material from neighbouring beaches. Zircon, presumably from the same source, was present in small quantities.

Biotite occurred in all samples, being common in the *Mesembryanthemum* soil, and very rare in the others.

The swampland soil differed markedly from the above types. Sponge spicules constituted the large proportion (about 80 per cent.) of the fine sand. The remaining 20 per cent. consisted mainly of quartz with magnetite, augite, plagioclase, olivine, and biotite in small amounts.

Soil Development.

The presence of augite in the fine sand, together with the shallowness of the soil and poor development of any profile, points to the very immature state of the soil.

Conditions of drainage at the island are excellent, and the formation of soil consists of an initial leaching of soluble bases mainly to the sea, and possibly in part to the swamp.

As soon as formed, silt and clay particles, together with run-off water are washed either into the swamp or the sea.

The origin of ironstone concretions is obscure; they may have been formed during geological weathering or in the process of soil formation.

A deeper and more mature profile has been developed, due to leaching down and deposition below of clay.

Material from which the swamp area has been formed evidently consists of finer fractions washed down from slopes.

General Fertility.

The texture, mode of development, and fertility of the soil on the island are apparently very similar to those of the Stony Rise soils on the mainland, described as Corangamite Stony Loam (1).

The Stony Rise soils are much more fertile and immature than the basaltic soils of the Western District generally.

From the abundance of primary minerals and organic matter it is to be concluded that the island soil is more fertile than the typical mainland soils on basalt, although shallowness of soil, distance from markets, and exposure to winds would probably inhibit any form of cultivation, while the presence of the large rabbit population is probably responsible for the paucity of the flora.

Reference.

1. Leeper, G. W., Ann Nicholls, and S. M. Wadham, 1936. Soil and Pasture Studies in the Mount Gellibrand Area, Western District of Victoria. *Proc. Roy. Soc. Vic.* (n.s.), xlix. (1), 77.

8. *Soil Bacteriology.*

By D. J. W. SMITH, B.Sc.

To determine the presence or absence of nitrogen-fixing and nitrifying bacteria in the soils of Lady Julia Percy Island, laboratory investigations were made upon samples taken from the five of the botanical areas represented.

1. *a.* An estimation of the *Azotobacter* population was obtained by counts upon silico-gels impregnated with the appropriate nutrients.
   b. The "soil-plaque" method was used for detecting their activity. In particular, any deficiency of Calcium or Phosphorus is revealed by this method.
2. An attempt was made to detect the symbiotic nitrogen fixers by the growth of clover and lucerne seedlings in flower pots and culture tubes. In the pot experiments, sterile seeds were sown in washed sterile sand, and inoculated with soil washings. As a control, a similar series of pots were inoculated with a suspension of the appropriate strains of *B. radicicola.* A parallel experiment was performed in tubes of nitrogen-free mineral agar; the seeds being coated with a layer of the soil under test.
3. The standard method of silico-gels impregnated with mineral salts, providing nitrogen in the form of (*a*) ammonium sulphate and (*b*) potassium nitrate, was used for the detection of nitrite and nitrate-producing organisms respectively.

As a first step, pH determinations were made on the five samples under examination.

Results of Tests.

The soil samples tested are indicated below by the letters A to E, as follows:—A—fernland: B—grassland: C—swampland: D—*Senecio* association: E—*Mesembryanthemum* association.

Ia. Azotobacter Count.

Silico-gels (prepared as set out in the appendix) were impregnated per plate with—

2 ccs. Saline A, .1 gm. Mannite, .02 gm. Calcium Carbonate, inoculated with grains of soil, and incubated at 27°C.

Table 1 shows that there was a considerable variation in bacterial numbers in the different samples, *Azotobacter* being almost, if not entirely, absent from A, B, and C. This is most probably to be correlated with the low pH values of some of the soils, soil acidity being more harmful to *Azotobacter* than to most organisms.

TABLE 1.

Time.	A. pH 5·70.		B. pH 4·84.		C. pH 5·19.		D. pH 5·72.		E. pH 6·32.		Control. Garden Soil.	
	i.	ii.	i.	ii.	i.	ii.	i.	ii.	i.	ii	i.	ii.
72 hours	–	–	– mould	– mould	– mould	– mould	–	·	+	+	++	++
8 days ..	–	–	– mould	– mould	3 colonies mould	– mould	+	+	++	++	++	++

1B. SOIL PLAQUES.

(*b*) From each sample, 200 gms. of sifted soil were taken and mixed with 2 gms. of mannite; the whole was divided into four, and the parts treated as below:

O. Control—moistened with distilled water.

P. Moistened with a solution containing .6 gms. $NaHPO_4$ and .33 gms. of NaH_2PO_4 per litre, giving a .1 per cent. sol. of phosphate pH7.

Ca. 1.5 gms. of $CaCO_3$ added, and moistened with distilled water.

Ca and P. 1.5 gms. of $CaCO_3$ added, and moistened with phosphate solution.

Each sample was ground up finely in a mortar, pressed down smoothly in a petri-dish, and the surface glazed with kaolin.

Plaques were incubated at 27°C.

In those soils having a very low pH, the soil-plaque test showed little or no growth even in the presence of phosphate and calcium carbonate; this failure was probably due to the scarcity of *Azotobacter* cells originally present in such soils; this supports the finding in 1 (*a*). Sample "E" (Plate XXI.), possessing a high grade *Azotobacter* flora, gave the most prolific growth when phosphorus was added, indicating a deficiency of available phosphate, which is common in volcanic soils of the type under test. The requirements of crop plants and of *Azotobacter* are similar as regards the need for soluble phosphate. Addition of $CaCO_3$ in the more acid samples "B" and "C," produced a slight growth after a long period of incubation. In "E," however, it slightly inhibited growth.

2. SYMBIOTIC NITROGEN-FIXERS.

The formation of root-nodules upon lucerne and clover plants was used as an index of the *B. radicicola* population in the soil. New 6-inch flower-pots were thoroughly washed with phenyle, rinsed with distilled water and filled with washed sand previously autoclaved for 4 hours. Lucerne and clover seeds, sterilized

TABLE 2.

Time.	Garden Soil.				A.				B.				C.				D.				E.	
	O.	P.	Ca.	Ca-P.	O.	P.	Ca.	Ca-P.	O.	P.	Ca.	Ca-P.	O.	P.	Ca.	Ca-P.	O.	P.	Ca.	Ca-P.	86 Hours Incubation.	
24 hours ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	O	+ + Few scattered colonies
48 hours ..	+	+ +	+	+ +	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	P	+ + + Thick jelly like growth covering plaque
86 hours ..	+	+ + +	+ +	+ + +	—	—	—	—	—	—	colonies 6	7	—	—	—	—	—	—	—	—	Ca	+ + Fine jelly reticulation of coalescing colonies
10 days ..	+	+ + +	+ +	+ + +	—	colonies 25	—	—	—	—	6	6	—	—	4	—	30	50	—	—	Ca and P	+ + Coarse jelly reticulation of coalescing colonies

by washing with 1/1000 $HgCl_2$ in 90 per cent. alcohol were sown, and the pots moistened with a watery extract (50 cc. water with 15 gms. soil) of the soil samples. A similar series of control pots was inoculated with an aqueous suspension of the appropriate *B. radicicola* type. The seedlings were grown in the glass-house over a period of 2½ months. In addition to normal watering, each pot was moistened twice per week with a nitrogen-free mineral solution.

TABLE 3.

TEST PLANTS.

A.		B.		C.		D.		E.		Garden Soil.		Sterile Sand.	
L.	C.	L.	C.	L.	C.	L.	C.	L.	C.	L.	C.	L.	C.
–	+	–	–	–	–	+	–	+	–	+	+	–	–

L = Lucerne. C = Clover.

CONTROL PLANTS.

A.		B.		C.		D.		E.		Garden Soil.		Sterile Sand.	
L.	C.	L.	C.	L.	C.	L.	C.	L.	C.	L.	C.	L.	C.
+	+	+	+	+	+	–	+	+	+	+	+	+	+

L = Lucerne. C = Clover.

The control plants showed a much more rapid initial growth, and in general produced the sturdier seedlings. Some of the "test" plants began to yellow off after 6 or 7 weeks, and when examined later, these proved to be without nodules. It was noticed that plants possessing nodules had a much shorter and sturdier root system than those with which nodule formation did not take place.

The experiment shows that *B. radicicola* "clover" strain is present only in sample "A" taken from the bracken area. The "lucerne" strain is present in samples "D" and "E." Both types were present in garden soil, and both were absent from the sterile sand medium without soil-washings.

A further test was made by using tubes of a nitrogen-free mineral agar as the medium, in place of sterile sand. The seeds were first sterilized, then coated with a layer of the soil to be tested, and sown four to a tube. In the control tubes a platinum loop full of the appropriate *radicicola* type was placed by each seed. Rapid growth occurred in the first week, but before the roots were sufficiently developed for nodule formation to take place, a thick growth of moulds occurred in most of the tubes, and the seedlings died off.

3. Nitrifiers.

Nitrite formers.

Standard silico-gels were used. Each plate impregnated with 2 ccs. Saline B, 1 cc. 5 per cent. $(NH_4)_2SO_4$, and enamelled with a thin cream of $MgCO_3$ in water. The plates were inoculated with soil, and incubated at 27°C.

Nitrate formers.

Silico-gels impregnated with 2 ccs. Saline B, 1 cc. 3 per cent. KNO_2 sol., enamelled with a thin cream of $CaCO_3$ and kaolin water. Inoculated and incubated at 27°C.

At the first attempt no growth was obtained after a period of 3 weeks incubation. A second series of plates were then inoculated from samples which had been previously moistened with the $(NH_4)_2$ SO_4 and the KNO_2 solutions respectively, and incubated at 27°C. for 24 hours. An abundant growth of "nitrite" producers was obtained from all samples, but "nitrate" formers could not be isolated.

Conclusion.

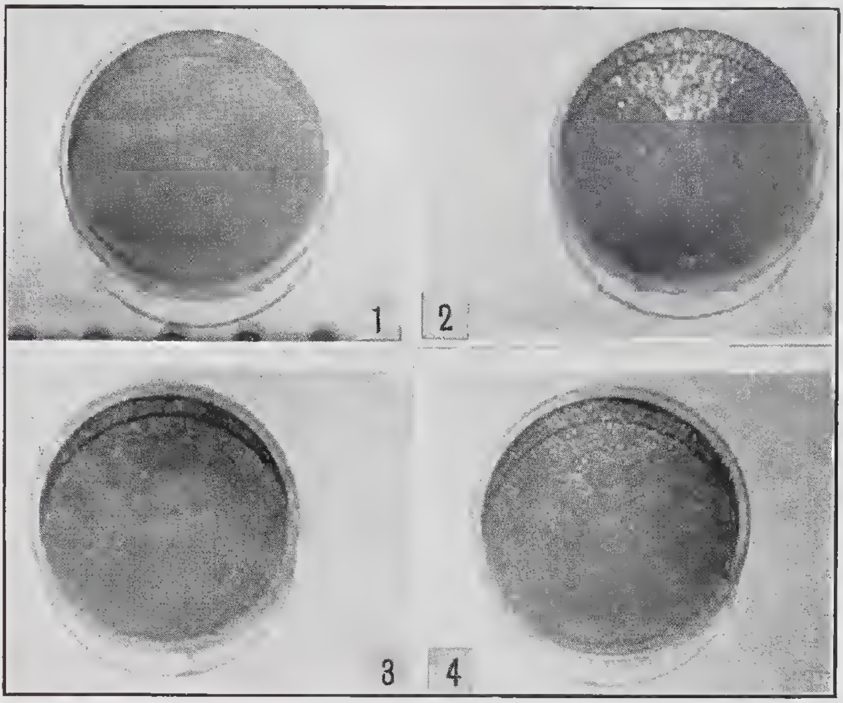
Sample E, representing soil derived from a particular lava flow, stands in contrast with the rest of the island soil in the possession of a very rich flora of aerobic nitrogen fixers, i.e., *Azotobacter* cells. The apparently random distribution of symbiotic "fixers" may well be associated with the complete absence of any leguminous plants from the island.

Although nitrate producing organisms could not be isolated, the occurrence of nitrite formers in all samples would indicate that the soil possesses a normal nitrifying flora.

Appendix.

Preparation of Silico-gels.

Equal volumes of Sodium silicate Sp.gr. 1.075 and Hydrochloric acid Sp.gr. 1.1725, mixed together. 30 ccs. of mixture per plate.



Photographs of Soil Plaques.

Mineral Salts Solutions.

Saline "A."

KH_2PO_4	1·0 gm.
$MgSO_4$	0·5 gm.
NaCl	0·5 gm.
$FeSO_4$	0·02 gm.
$MnSO_4$	0·02 gm.
H_2O dist.	200 ccs.
	pH 7·3

Saline "B."

K_2HPO_4	0·5 gms.
$MgSO_4$	0·5 gms.
NaCl	0·3 gms.
$FeSO_4$	0·02 gms.
$MnSO_4$	0·02 gms.
Traces of Zn.Mg.Al. from tap-water.	
H_2O dist.	200 ccs.

Watering Solution.

KCl	10 gms.
$CaSO_4 2H_2O$	2·5 gms.
$MgSO_4 . 7H_2O$	2·5 gms.
$Ca_3(PO_4)_2$	2·5 gms.
$FePO_4$	2·5 gms.

Use 1·5 gms. in 100 ccs. of water.

"N" Free Mineral Agar.

K_2HPO_4	0·5 gms.
$MgSO_4 . 7H_2O$ ..	0·2 gms.
NaCl	0·1 gms.
$Ca_3(PO_4)_2$	2·0 gms.
$FeCl_3$	0·01 gms.
Agar	10·0 gms.
Water	1 litre.

Description of Plate XXI.

Soil Plaques of Sample "E," illustrating the response of *Azotobacter* to added calcium carbonate and phosphate: 1. Control; 2. phosphate added; 3. calcium carbonate added; 4. phosphate and calcium carbonate added.

9. *List of Vascular Plants.*

By R. T. PATTON, D.Sc.

	Species.	Remarks.
Polypodiaceae ..	*Asplenium scleroprium* Honrb. et Jacq.	In cave, south end
	Pteridium aquilinum Kuhn.	
Gramineae ..	*Phalaris minor* Retz.	
	Poa caespitosa G. Forst.	On cliffs
	Dichelachne crinita (L) Hk.f.	
	Calamagrostis filiformis Pilg.	
	Hordeum murinum L.	On cliffs
Cyperaceae ..	*Scirpus nodosus* Rottb.	,,
Juncaceae ..	*Juncus pallidus* R.Br.	
Urticaceae ..	*Urtica dioica* L.	
Chenopodiaceae	*Chenopodium glaucum* L.	In swamp
	Enchylaena tomentosa R.Br. ..	On cliffs
	Rhagodia baccata Moq.	,,
	Salicornia australis Sol.	Near spring
Aizoaceae ..	*Mesembryanthemum aequilaterale* Haw.	High ground, south end
	M. australe Sol.	On cliffs
Caryophyllaceae	*Polycarpon tetraphyllum* L.	
	Sagina apetala L.	South end
	Spergularia rubra Presl.	Near spring
Cruciferae ..	*Lepidium foliosum* Desv.	On cliffs
Geraniaceae ..	*Pelargonium australe* Willd. ..	,,
Onagraceae ..	*Epilobium junceum* G. Forst.	
Umbelliferae ..	*Apium australe* Thou.	High ground, south end
Gentianaceae ..	*Erythraea spicata* Pers.	
Apocynaceae ..	*Alyxia buxifolia* R.Br.	On cliffs
Convolvulaceae ..	*Dichondra repens* R. & G. Forster ..	Plentiful among *Mesembryanthemum equilaterale*
Solanaceae ..	*Solanum aviculare* G. Forst. ..	On cliffs
Compositae ..	*Calocephalus Brownii* F.v.M. ..	,,
	Gnaphalium indutum Hk. f.	
	Cotula Coronopifolia L.	Near spring
	Senecio lautus Sol.	
	Carduus pycnocephalus Jacq.	

10. *List of Algae.*

By R. T. PATTON, D.Sc.

CHLOROPHYCEAE.

Caulerpa hypnoides Ag.	Caulerpaceae
Codium tomentosum Stackn.	Codiaceae
Ulva lactuca Linn.	Ulvaceae

PHAEOPHYCEAE.

Ecklonia radiata Ag.	Alariaceae
Lobospira bicuspidata Aresch.	Dictyotaceae
Phyllospora comosa Ag.	Fucaccae
Seirococcus axillaris Grev.	Fucaceae
Zonaria crenata	Dictyotaceae

RHODOPHYCEAE.

Ballia callitricha Ag.	Ceramiaceae
B. scoparia Harv.	Ceramiaceae
Corallina spp.	Corallinaceae
Gelidium glandulaefolium H. et H.	Gelidiaceae
Laurencia elata Harv.	Rhodomelaceae
Nitophyllum sp.	Delesseriaceae
Nizymenia australis Sond.	Gelidiaceae
Phacelocarpus Labillardieri Ag.	Sphaerococcaceae
Plocamium Preissianum Sond.	Rhodymeniaceae

11. *Coelenterata.*

By MAURICE BLACKBURN, B.Sc.

Class HYDROZOA.

Ten genera and twenty species of Calyptoblastea typical of the Bass Strait region were collected. The occurrence of gonothecae is indicated for those species in which they were found. The specimens were derived from three sources, viz.:—

Locality 1.—On seaweed dredged from 25 fathoms off West Cape.

Locality 2.—Drift material washed up between Seal Bay and Dinghy Cove.

Locality 3.—Forms growing in rock pools between West Cape and Dinghy Cove.

Family CAMPANULARIIDAE.

Orthopyxis macrogona (von Lendenfeld, 1884).

Campanulina calyculata var. *makrogona* von Lendenfeld, 1884. Proc. Linn. Soc. N.S.W., ix., p. 922.

Orthopyxis macrogona (von Lendenfeld), Bale, 1914, Proc. Roy. Soc. Vic., n.s., xxvii. (1), p. 77, pls. xi., xii.

Four specimens were found growing on the test of a tunicate (*Amaroucium* sp.). Although no gonangia were present the form has been referred to *O. macrogona* because of the square form of the hydrotheca in the broad aspect, which is a characteristic of this species. Loc. 3.

Campanularia tincta (Hincks, 1861).

Campanularia tincta Hincks, 1861, Ann. Mag. Nat. Hist., ser. 3, vii., p. 280.

Loc. 1.

Family CAMPANULINIDAE.

Thyroscyphus marginatus (Bale, 1884).

Campanularia marginata Bale, 1884, Aust. Mus. Cat. Hyd. Zooph., p. 54, pl. 1.

Thyroscyphus marginatus (Bale), 1914, *loc. cit.*, p. 91.

Loc. 2.

Thyroscyphus simplex (Lamouroux, 1816).

Laomedea simplex Lamouroux, 1816, Hist. Polyp. Corall. Flex., p. 206.

Thyroscyphus simplex (Lamouroux), Bale, 1915, Sci. Results *Endeavour* Exped., iii., p. 245.

Loc. 2.

Family HALECIDAE.

Ophiodissa fragilis, sp. nov.
(Figs. 1A–D.)

Hydrorhiza a network of stout tubes; stem monosiphonic, maximum height about 15 mm., unbranched, fairly straight at the proximal end, but becoming more or less zigzag at the top, divided into internodes by oblique twists, the internodes varying somewhat in length and each bearing a hydrophore at the summit and being conspicuously twisted below.

Primary hydrophores alternate, borne on "peduncles" arising from the upper parts of the internodes and generally only very slightly ascending. (The term "peduncles" is used for convenience, these jointed processes probably representing the proximal ends of the hydrophores.) Peduncles jointed, the joints varying in number from two to four, each characterized by an internal constriction of the perisarc; frequently the peduncles are of very great length owing to the abnormal prolongation of one or more of the joints. Hydrophores bell-shaped, with an internal perisarcal septum almost separating off the upper two-thirds of the cup. The row of bright points encircling the rim, a common feature in this family, appears in all cases to be absent. Secondary hydrophores occasionally are observed arising from the peduncles; a specimen shows one with an abnormally elongated series of proximal joints along which a hydrophore of the third order has arisen.

Sarcothecae, fairly large vase-shaped cups, each arising from the peduncle of a hydrophore. In some cases these were missing, possibly due to their having been broken off. One of the sarcothecae contained a partly extruded capitate dactylozooid typical of the genus.

Gonangia subspherical, arising at the junction between stem and peduncles, as well as stem and hydrorhiza.

This form was found living on the underside of a rock in a shallow pool in Dinghy Cove. The capitate dactylozooid definitely refers it to *Ophiodissa*. This form differs from all eight species of this genus except *O. caciniformis* Ritchie in being wholly unbranched, although the structures described as branches for *O. gracilis* Fraser (and possibly others) may represent the elongated peduncles which appear as a variation in the present form. The twisted internodes, regular location of the sarcothecae, very slightly ascending peduncles and the character of the gonangia are distinctive.

Additional material from Balnarring, Western Port (coll. Stach and Tubb, May, 1936) agrees exactly with the types. However, despite their excellent preservation, only one sarcotheca was found on the fifteen colonies examined, indicating that the appearance of the cups on the peduncles is by no means regular.

Fig. 1.—*Ophiodissa fragilis.* A. Section of stem showing internodes bearing "peduncles" with primary and secondary hydrophore (left) and sarcotheca (right). B. Junction of stem and hydrorhiza showing gonangium, also "peduncle" with sarcotheca. C. Stem internode bearing primary hydrophore, elongated "peduncle" of secondary hydrophore and tertiary hydrophore. D. Junction of stem and peduncle of hydrophore, the latter bearing sarcotheca with dactylozooid. Mag. 40. Ped., elongated peduncle of secondary hydrophore; p.h., primary hydrophore; s., sarcotheca; s.h., secondary hydrophore; t.h., tertiary hydrophore.

Fig. 2.—*Sertularia bicuspidata.* Gonotheca. Mag. 20.

Family SERTULARIIDAE.

SERTULARIA ACUTA (Stechow, 1921).

Sertularia loculosa Bale (*non* Busk), 1884, *loc. cit.*, p. 91, pl. iv. Idem, 1913, Proc. Roy. Soc. Vic., n.s., xxvi. (1), p. 121, pl. xiii.

Tridentata acuta Stechow, Zool. Jahrb., Abt. f. Syst., xlvii., 1923, pp. 204, 206.

Loc. 1.

SERTULARIA PULCHELLA Thompson, 1879.

Sertularia pulchella Thompson, 1879, Ann. Mag. Nat. Hist., ser. 5, iii., p. 108, pl. xviii., fig. iii.

Loc. 1.

SERTULARIA BICUSPIDATA Lamarck, 1816.

Sertularia bicuspidata Lamarck, Hist. Anim. s. Vert., v., 1816, p. 121.

Sertularia bicornis Bale, 1881, Journ. Micro. Soc. Vic., ii., p. 22, pl. xii., fig. iii.

The shoots, though pinnate, are extremely small, the maximum length being 3 mm. The gonothecae, not previously described, are regularly ovate, arising from the main stem by a short stalk; aperture circular, with an elevated rim; length of gonothecae about equal to that of three stem internodes.

Loc. 1.

SERTULARIA MCCALLUMI (Bartlett, 1907).

Sertularella mccallumi Bartlett, 1907, Geelong Nat., ser. 2, iii. (4), p. 62.

Sertularia mccallumi (Bartlett), Bale, 1919, Proc. Roy. Soc. Vic., n.s., xxxi. (2), p. 340, pl. xvi.

Loc. 1.

SERTULARELLA PEREGRINA Bale, 1926.

Sertularella gaudichaudi (Lamouroux), Bale, 1915, *loc. cit.*, p. 280.

Sertularella peregrina Bale, Proc. Roy. Soc. Vic., n.s., xxxviii., 1926, p. 19, fig. iv.

This form was actively increasing by budding. The polyps exhibit a raised conical hypostome surrounded by a single circlet of about twenty delicate filiform tentacles.

Loc. 3.

SERTULARELLA ROBUSTA Coughtrey, 1875.

Sertularella robusta Coughtrey, 1875, Trans. N.Z. Inst., viii., p. 300. Trebilcock, 1928, Proc. Roy. Soc. Vic., n.s., xli. (1), p. 16.

Previously recorded from New Zealand. If *S. microgona* von Lendenfeld and *S. angulosa* Bale are correctly referred to this species, the range must be extended to include Port Phillip. Trebilcock has already suggested this with regard to the latter species. Loc. 3, associated with *S. gaudichaudi*.

Sertularella indivisa Bale, 1881.

Sertularella indivisa Bale, 1881, *loc. cit.*, p. 24, pl. xii., fig. vii. Idem, 1915, *loc. cit.*

Hydrothecae smooth, rugae hardly discernible. Loc. 2.

Sertularella neglecta Thompson, 1879.

Sertularella neglecta Thompson, 1879, *loc. cit.*, p. 100, pl. xvi., fig. 1.

Gonothecae abundant, borne near the middle of the pinnae. Loc. 1.

Family SYNTHECIDAE.

Stereotheca elongata (Lamouroux, 1816).

Sertularia elongata Lamouroux, 1816, *loc. cit.*, p. 189, pl. v., fig. iii.

Stereotheca elongata (Lamouroux), Bale, 1924, Trans. N.Z. Inst., lv., p. 252.

Very common. Gonothecae generally present. Loc. 2.

Family PLUMULARIIDAE.

Group ELEUTHEROPLEA.

Plumularia balei Bartlett, 1907.

Plumularia balei Bartlett, 1907, *loc. cit.*, p. 65.

Loc. 2.

Plumularia setaceoides Bale, 1881.

Plumularia setaceoides Bale, 1881, *loc. cit.*, p. 40, pl. xv., fig. iv.

Loc. 2.

Plumularia goldsteini Bale, 1881.

Plumularia goldsteini Bale, 1881, *loc. cit.*, p. 41, pl. xv., fig. vii.

Loc. 1.

Plumularia spinulosa Bale, 1880.

Plumularia spinulosa Bale, 1880, *loc. cit.*, p. 42, pl. xv., fig. viii.

The terminal spine is rounded in these forms.

Loc. 1.

Group STATOPLEA.

Aglaophenia divaricata (Busk, 1852).

Plumularia divaricata Busk, 1852, Voyage of "Rattlesnake," i., p. 398.

Aglaophenia divaricata (Busk), Bale, 1884, *loc. cit.*, p. 162.

Loc. 3.

Halicornaria longirostris (Kirchenpauer, 1872).

Aglaophenia longirostris Kirchenpauer, 1872, Abh. Ver. Hamburg, v., 3, p.

Halicornaria longirostris (Kirchenpauer), Bale, 1884, *loc. cit.*, p. 181, pl. xiii.

Loc. 3.

Class ANTHOZOA.

The Gorgonacean was dredged from 25 fathoms off West Cape. The Actinians were obtained from rock pools and shore platforms between Dinghy Cove and McCoy Platform and the coral was found in a dry and weathered condition in a joint plane at the top of McCoy Platform.

Subclass ALCYONARIA.

Order GORGONACEA.

Family MELITODIDAE.

CLATHRARIA (?) AKALYX Kukenthal, 1908.

Clathraria akalyx Kukenthal, 1908, Zool. Anzeiger, xxiii., p. 201.

The branching colony, attached to the Bryozoan, *Adeona grisea,* is about 18 cm. high and 14 cm. in its broadest aspect. The colour when dry is creamy white, the nodes being faintly tinged with red. Anastomosis of the branches occurs rarely.

The characters of the specimen agree with *Clathraria* and this form is tentatively referred to the sole Australian species of the genus, *C. akalyx,* in which the mode of branching is closely similar, the colour when alive being red. Previously known from Sharks Bay, Western Australia.

Subclass ZOANTHARIA.

Order ACTINIARIA.

The classification adopted is that of Haddon (1898, Trans. Roy. Dublin Soc., ser. 2, vi., p. 394) with the emendations of Stephenson (1922, Quart. Journ. Micro. Sci., lxvi., p. 265) for Actiniidae.

Many of these names are queried in the following list; this precaution has been taken in the absence, for comparison, of specimens from type localities.

Family ACTINIIDAE.

ACTINIA cf. EQUINA Linnaeus, 1767.

Actinia equina Linnaeus, 1767, Syst. Nat., ed. 12, p. 1088.

Extremely abundant on the shores of the island. Dissected specimens contained fertile gonads and embryos at various stages, some being liberated in large numbers through the mouths of the parents and becoming fixed to the rocks almost immediately. Because of its invariable dark red colour this form has been described from New Zealand as a separate species, *A. tenebrosa* Farquhar, 1898. There seems, however, no more justification for separating this form than for many other colour varieties of *A. equina.* Previously recorded from New Zealand and European waters; also E. Africa, St. Thomas, and Juan Fernandez.

ANEMONIA cf. SULCATA (Pennant, 1766).

Actinia sulcata Pennant, 1766, A British Zoology.

Anemonia sulcata (Pennant), Milne-Edwards, 1857, Nat. Hist. Cor. Polypes, i., p. 233.

Average height of column in life about 6 cm.; average diameter of pedal disc from 10 to 12 cm. Column dull red in some specimens and green in others. Tentacles long and of a light brownish green colour. The external characters and weak (possibly absent) sphincter muscle confirm the identification. Previously recorded from European waters and Palestine.

ANEMONIA OLIVACEA (Hutton, 1878).

Anthea olivacea Hutton, 1878, Trans. N.Z. Inst., xi., p. 312.

Anemonia olivacea (Hutton), Farquhar, 1898, Journ. Linn. Soc., xxvi., p. 527.

This common form occurred in various tonings of red, brown, orange and yellow, as well as the olive-green variety described from New Zealand. The puffy capitular rim and yellow stellate pattern on the oral disc confirm the identification. Previously known only from New Zealand.

TEALIA cf. CRASSICORNIS (Muller, 1766).

Actinia crassicornis Muller, 1766, Zool. Dan. Prodromus, p. 231.

Tealia crassicornis (Muller), Gosse, 1858, Ann. Mag. Nat. Hist., ser. 3, i., p. 414.

Previously recorded from European waters, Canada, and Juan Fernandez.

BUNODACTIS cf. INCONSPICUA (Hutton, 1878).

Phymactis inconspicua Hutton, 1878, *loc. cit.*, p. 313.

Bunodes inconspicua (Hutton), Stuckey, 1908, Trans. N.Z. Inst., xli., p. 394.

A few specimens appear to belong to this species. Colour of column a glaucous olive green; tentacles dull purplish red. Average height of column 15 mm.; diameter of expanded oral disc about 15 mm. Verrucae of column only properly visible on the upper part; lower down the surface is much folded, the verrucae small and weak and the whole surface covered with a rough cuticular substance. The last character is an important feature of the species. Sections of the sphincter muscle reveal it to be rather less circumscribed than other workers suggest. The generic name *Bunodes* has been replaced by *Bunodactis* Verrill, 1899. Previously recorded from New Zealand.

Family SAGARTIIDAE.

SAGARTIA ALBOCINCTA (Hutton, 1878).

Gregoria albocincta Hutton, 1878, *loc. cit.*, p. 312.

Sagartia albocincta (Hutton), Stuckey, 1908, *loc. cit.*, p. 382.

These specimens exhibited typical coloration and internal structure. Acontia were emitted freely on the slightest disturbance. Mature gonads were found, but no embryonic stages. Previously recorded from New Zealand; also recently collected by me from Port Fairy and Western Port.

Family CORALLIMORPHIDAE.

CORYNACTIS AUSTRALIS Haddon and Duerden, 1896.

Corynactis australis Haddon and Duerden, 1896, Trans. Roy. Dublin Soc., ser. 2, vi., p. 160.

Associated with growing Hydroids and colonial ascidians. Height of column in largest specimen about 5 mm.; diameter of expanded oral disc 7 mm. Tentacles about 114, conspicuously knobbed, radial arrangement conspicuous, but quite asymmetrical. Reproduction by budding from a common coenenchyme appeared to be taking place and no gonads were found. In general, anatomical and histological details agreed with the description for *C. australis*. The exact disposition of the mesenteries could not be seen, but there were at least 15 perfect pairs. Previously recorded from Port Phillip.

Order MADREPORARIA.

Family ORBICELLIDAE.

A small bleached fragment of a colonial coral was found associated with marine organic debris in a joint plane at the top of McCoy Platform. It is definitely an orbicellid type, but the genus is not determinable.

12. *Echinodermata.*

By LEO. W. STACH, B.Sc.

All the forms listed below were collected from the rock pools at Dinghy Cove, except *Goniocidaris geranioides tubaria* and *Astroconus australis* which were obtained from 25 fathoms off West Cape.

Class ASTEROIDEA.

Order PHANEROZONIA.

Family GONIASTERIDAE.

TOSIA AUSTRALIS Gray, 1840.

Tosia australis Gray, 1840, Ann. Mag. Nat. Hist., ser. 1, vi, p. 281. Clark, 1928, Rec. South Aust. Mus., iii. (4), p. 381.

Several specimens of the variation described as "var. *astrologorum* (Muller and Troschel, 1842)" were found occurring with the more numerous typical forms.

Order SPINULOSA.

Family ASTERINIDAE.

ASTERINA (ASTERINA) SCOBINATA Livingstone, 1933.

Asterina scobinata Livingstone, 1933, Rec. Aust. Mus., xix. (1), p. 1, pl. v., figs. 9-12, 15.

The three specimens of this form previously known bear the vague locality, "Tasmania." Two specimens were taken from under stones in the rock pools at Dinghy Cove. It also occurs rarely under rocks on Point Leo reef, Shoreham, Western Port (Stach coll.), while specimens at the National Museum are from Port Albert.

ASTERINA (PATIRIELLA) CALCAR (Lamarck, 1816).

Asterias calcar Lamarck, 1816, Anim. sans Vert., ii., p. 557.

Patiriella calcar (Lamarck), Clark, 1928, *loc. cit.*, p. 391.

The blue-green tints of this form were much deeper than is usual with mainland specimens. Livingstone is followed in placing *Patiriella* as a subgenus of *Asterina*.

ASTERINA (PATIRIELLA) EXIGUA (Lamarck, 1816).

Asterias exigua Lamarck, 1816, *loc. cit.*, p. 554.

Patiriella exigua (Lamarck), Clark, 1928, *loc. cit.*, p. 392.

Family ASTERIIDAE.

COSCINASTERIAS CALAMARIA (Gray, 1840).

Asterias calamaria Gray, 1840, *loc. cit.*, p. 179.

Coscinasterias calamaria (Gray), Clark, 1928, *loc. cit.*, p. 399.

ALLOSTICHASTER POLYPLAX Verrill, 1914.

Allostichaster polyplax Verrill, 1914, Harriman Alaska Exped., Starfishes, p. 363.

Class OPHIUROIDEA.

Order PHRYNOPHIURIDA.

Family GORGONOCEPHALIDAE.

ASTROCONUS AUSTRALIS (Verrill, 1876).

Astrophyton australe Verrill, 1876, Bull. U.S. Nat. Mus., iii., p. 74.
Astroconus australis (Verrill), Clark, 1928, *loc. cit.*, p. 419.

This common deep water form was found with the arms entwined about a fragment of sponge. Other records of the same mode of occurrence indicate that this is apparently the normal method of feeding.

Order CHILOPHIURIDA.

Family OPHIOCHITONIDAE.

OPHIONEREIS SCHAYERI (Muller and Troschel, 1844).

Ophiolepis schayeri Muller and Troschel, 1844, Arch. für Naturg., x., p. 182.
Ophionereis schayeri (M. and T.), Clark, 1928, *loc. cit.*, p. 435.

Class ECHINOIDEA.

Order CIDAROIDA.

Family CIDARIDAE.

GONIOCIDARIS GERANIOIDES TUBARIA (Lamarck, 1816).

Cidarites tubaria Lamarck, 1816, *loc. cit.*, p. 57.
Goniocidaris geranioides tubaria (Lamarck), Clark, 1928, *loc. cit.*, p. 455.

Order CENTRECHINOIDA.

Family STRONGYLOCENTROTIDAE.

HELIOCIDARIS ERYTHROGRAMMUS (Valenciennes, 1846).

Echinus erythrogrammus Valenciennes, 1846, Voy. "Venus," Zooph., pl. vii., fig. 1.
Heliocidaris erythrogrammus (Val.), Clark, 1928, *loc. cit.*, p. 468.

13. *Bryozoa.*

By LEO. W. STACH, B.Sc.

The material examined was derived from three *in situ* faunules, viz., from 25 fathoms off West Cape (3), from the rock pool behind the landing platform at Dinghy Cove (5) and from kelp roots at 6 fathoms in Dinghy Cove (7). Some species from the rock pools on the north coast of West Cape (6) are of drift origin. Drift material was obtained from red algae washed up at Dinghy Cove (1), among pebbles and basalt sand west of Dinghy Cove (4) and from the joint planes in the basalt of McCoy Platform (2). This latter source yielded a prolific collection practically duplicating faunule 3, storm waves being responsible for its present position. The rock pool communities are markedly distinct from the deeper water facies, the former being characterized here by the small number of species, predominance of petraliform zoaria, rare reteporiform and stunted catenicelliform elements, while the deeper water facies (3) is characterized by dominant catenicelliform and cellariform zoaria with lesser membraniporiform, reteporiform and flustriform elements (*vide* Stach, 1936, Journ. Geol., xliv. (1), pp. 60-65). The seventy-seven species recorded are typical of the Bass Strait region.

Sub-phylum ENTOPROCTA.

Family PEDICELLINIDAE.

PEDICELLINA WHITELEGGEI Johnston and Walker, 1917.

Pedicellina whiteleggei Johnston and Walker, 1917, Proc. Roy. Soc. Queensland, xxix. (5), p. 60, fig. 14.

Neither of the two calyces collected from a serpulid substratum at Loc. 6 bear spines, but the spines of the peduncle and all other characters agree with topotypes in the collection of Prof. Harvey Johnston. The discrepancy is in accord with the variation described for *P. cernua* (Pallas) by Osburn (Bull. U.S. Bureau Fish., xxx., p. 213).

Sub-phylum ECTOPROCTA.

Class STENOLAEMATA.

Order CAMPTOSTEGA.

Family CRISIIDAE.

BICRISIA BICILIATA (Macgillivray, 1869).

Crisia biciliata Macgillivray, 1869, Trans. Proc. Roy. Soc. Vic., ix., p. 141.

Loc. 3.

BICRISIA WARRNAMBOOLENSIS Stach, 1935.

Bicrisia warrnamboolensis Stach, 1935, Aust. Zool., viii. (2), p. 143, figs. 1-4.

The stolons of this and the preceding species were attached to a red alga. Loc. 3.

Crisia acropora Busk, 1852.

Crisia acropora Busk, 1852, Voyage of "Rattlesnake," i., p. 351.

The present occurrences suggest a deeper water habitat for this species, but specimens have been collected on reefs in Western Port at low tide. Locs. 1, 2, 3, 6, 7.

Crisia setosa Macgillivray, 1869.

Crisia acropora Busk, 1852, Voyage of "Rattlesnake," i., p. 351.

Found as drift material at Loc. 6 and on red alga at Loc. 3.

Order ACAMPTOSTEGA.

Family TUBULIPORIDAE.

Idmonea australis Macgillivray, 1882.

(Pl. XXII., Fig. 2.)

Idmonea australis Macgillivray, 1882, Prod. Zool. Vict., dec. vii., p. 30, pl. lxviii., fig. 2.

The suggestion that *I. australis* is conspecific with *I. atlantica* Forbes is dispelled by comparison of the present material with specimens of *I. atlantica* from Kvaenangsfjord, Tromso (Norway) (det. C. Aurivillius) (Pl. XXII., Fig. 1). Dimensions of *I. australis* and *I. atlantica* are respectively:—width of branch 0.75 mm., 0.5 mm.; distance between apertures 0.75, 0.45; diameter of aperture 0.15, 0.09. The zooecial tubes of *I. australis* are more or less parallel with the upper face of the branch, while in *I. atlantica* they are directed nearly at right angles to it. Locs. 2, 3.

Idmonea radians (Lamarck, 1816).

Retepora radians Lamarck, 1816, Hist. Nat. An. sans Vert., ii., p. 183.
Idmonea radians (Lamarck), Macgillivray, 1882, *loc. cit.*, p. 30, pl. lxviii., fig. 3.

Locs. 2, 3.

Order PACHYSTEGA.

Family HORNERIDAE.

Hornera foliacea Macgillivray, 1869.

Hornera foliacea Macgillivray, 1869, *loc. cit.*, p. 142. Locs. 2, 3.

Hornera robusta Macgillivray, 1883.

Hornera robusta Macgillivray, 1883, Trans. Proc. Roy. Soc. Vic., xix., p. 291, pl. i., fig. 1.

Locs. 2, 3.

Order CALYPTROSTEGA.

Family LICHENOPORIDAE.

Lichenopora echinata (Macgillivray, 1884).

Discoporella echinata Macgillivray, 1884, Trans. Proc. Roy. Soc. Vic., xx., p. 127, fig. 4.
Lichenopora echinata (Macgillivray), 1887, Trans. Proc. Roy. Soc. Vic., xxiiii., p. 219.

Loc. 3.

Order HETEROPORINA.

Family HETEROPORIDAE.

DENSIPORA CORRUGATA Macgillivray, 1881.

Densipora corrugata Macgillivray, 1881, Trans. Proc. Roy. Soc. Vic., xvii., p. 17, fig. 2. Borg, 1933, Zool. Bidr. Uppsala, xiv., p. 342, pl. xiii., figs. 1-7, text-figs. 21-24.

This species is the major constituent of the epiphytic faunal community of the marine angiosperm, *Cymodocea antarctica* Endlicher, and until now it has been recorded only from this substratum. Locs. 2, 3. At the latter locality specimens occurred on slender cylindrical stems of a brown alga.

Class GYMNOLAEMATA.

Order CHEILOSTOMATA.

Suborder ANASCA.

Family MEMBRANIPORIDAE.

ACANTHODESIA UNCINATA (Macgillivray, 1890).

Biflustra uncinata Macgillivray, 1890, Proc. Roy. Soc. Vic., n.s., ii., p. 107, pl. v., fig. 2.

Loc. 2.

Family ELECTRIDAE, nom. mut.

Electrinidae d'Orbigny, 1852, Pal. Franc. Terr. Cret., v., p. 329. Canu and Bassler, 1920, U.S. Nat. Mus. Bull., No. 106, p. 73.

Harmer (1926, Repts. "Siboga" Exped., Mon. xxvii. b, p. 206) and Bassler (1935, Foss. Cat., lxvii., p. 102) place *Electrina* d'Orbigny, 1851 in the synonymy of *Electra* Lamouroux, 1816. Consequently the family name must undergo the above change (Art. 5, *Intern. Rules Zool. Nomen.*).

ELECTRA PILOSA (Linnaeus, 1767).

Flustra pilosa Linnaeus, 1767, Syst. Nat., ed. 12, p. 1301.
Electra pilosa (Linnaeus), Livingstone, 1929, Vid. Medd. Dansk Naturh. Foren., lxxxvii., p. 51.

Loc. 6.

Family FLUSTRIDAE.

CARBASEA INDIVISA Busk, 1852.

Carbasea indivisa Busk, 1852, Cat. Mar. Poly. Brit. Mus., i., p. 53, pl. lviii., figs. 3, 4.

Carbasea cyathiformis Macgillivray, 1860, Trans. Phil. Inst. Vic., iv., p. 97, fig. 2.

Numerous cup-like colonies from Loc. 3 were attached by radicles to *Scuticella margaritacea* (Busk).

SPIRALARIA FLOREA Busk, 1861.

Spiralaria florea Busk, 1861, Quart. Journ. Micro. Sci., n.s., i., p. 153.

Loc. 3.

Family HINCKSINIDAE.

Hincksina corbula (Hincks, 1880).

Membranipora corbula Hincks, 1880, Ann. Mag. Nat. Hist., ser. 5, vi., p. 378, pl. xvii., fig. 6.

Encrusting a red alga at Loc. 3.

Hincksina serrata (Macgillivray, 1869).

Membranipora serrata Macgillivray, 1869, *loc. cit.*, p. 131.

The specimens, from Loc. 6, bore ovicells containing larvae

Family AETEIDAE.

Aetea anguina (Linnaeus, 1758).

Sertularia anguina Linnaeus, 1758, Syst. Nat., ed. 10, p. 816.
Aetea anguina (Linnaeus), Macgillivray, 1887, *loc. cit.*, p. 195.

Loc. 6.

Aetea dilatata (Busk, 1851).

Anguinaria dilatata Busk, 1851, Ann. Mag. Nat. Hist., ser. 2, vii., p 85.
Aetea dilatata (Busk), Jelly, 1889, Syn. Cat. Rec. Mar. Bryo., p. 4.

Loc. 3.

Family ARACHNOPUSIIDAE.

Arachnopusia monoceros (Busk, 1854).

Lepralia monoceros Busk, 1854, Cat. Mar. Poly. Brit. Mus., ii., p. 72, pl. xciii., figs. 5, 6.
Arachnopusia monoceros (Busk), Livingstone, 1924, Rec. Aust. Mus., xiv. (3), p. 203.

Locs. 2, 3, 4.

Arachnopusia acanthoceros (Macgillivray, 1887).

Cribrilina acanthoceros Macgillivray, 1887, *loc. cit.*, p. 68, pl. ii., fig. 4.
Arachnopusia acanthoceros (Macgillivray), Livingstone, 1924, *loc. cit.*, p. 204.

Locs. 2, 3.

Family MICROPORIDAE.

Caleschara denticulata (Macgillivray, 1869).

Eschara denticulata Macgillivray, 1869, *loc. cit.*, p. 138.
Caleschara denticulata (Macgillivray), Stach, 1935, Proc. Roy. Soc. Vic., n.s., xlvii. (2), p. 340.

Locs. 2, 3.

Micropora coriacea (Esper, 1791).

Flustra coriacea Esper, 1791, Die Pflanzenthiere, pl. vii., fig. 2.
Micropora coriacea (Esper), Canu and Bassler, 1920, *loc. cit.*, p. 235.

The specimens obtained bore ovicells containing larvae. Loc. 5.

Family STEGANOPORELLIDAE.

Steganoporella truncata Harmer, 1900.

Steganoporella truncata Harmer, 1900, Quart. Journ. Micro. Sci., xliii., p. 276, pl. xii., fig. 9, pl. xiii., figs. 36, 37.

Loc. 2.

Family CELLARIIDAE.

Cellaria setigera Pergens, 1887.

Cellaria setigera Pergens, 1887, Bull. Soc. Roy. Malac. Belge, xxii., p. 89. Stach, 1935, *loc. cit.*, p. 342.

Locs. 1, 2, 3, 7.

Cellaria tenuirostris (Busk, 1852).

Salicornaria tenuirostris Busk, 1852, *loc. cit.*, i., p. 17, pl. lxiii., fig. 4.
Cellaria tenuirostris (Busk), Macgillivray, 1887, *loc. cit.*, p. 201.

Loc. 3.

Family SCRUPOCELLARIIDAE.

Bugulopsis cuspidata (Busk, 1852).

Cellularia cuspidata Busk, 1852, *loc. cit.*, p. 19, pl. xxvii., figs. 1, 2.
Bugulopsis cuspidata (Busk), Levinsen, 1909. Morph. Syst. Stud. Cheil. Bryo., p. 132.

Attached to red alga at Loc. 3 and to *Vittaticella buskii* (Thomson) at Loc. 7. Also at Loc. 2.

Caberea darwinii Busk, 1884.

Caberea darwinii Busk, 1884, Challenger Repts., xxx., p. 29, pl. xxxii., fig. 6. Jelly, 1889, *loc. cit.*, p. 31.

Locs. 3, 6, 7.

Caberea glabra Macgillivray, 1886.

Caberea glabra Macgillivray, 1886, Trans. Proc. Roy. Soc. Vic., xxii., p. 129.

Locs. 3, 5.

Caberea grandis Hincks, 1881.

Caberea grandis Hincks, 1881, Ann. Mag. Nat. Hist., ser. 5, viii., p. 2, pl. iii., fig. 4. Stach, 1935, *loc. cit.*, p. 342, pl. xii., fig. 3.

Locs, 2, 3.

Emma crystallina Gray, 1843.

Emma crystallina Gray, 1843, in Dieffenbach's "New Zealand," ii., p. 293. Harmer, 1923, Journ. Linn. Soc. Zool., xxxv., p. 357.

Locs. 2, 3, 5.

Emma buskii (Thomson, 1858).

Menipea buskii Thomson, 1858, *loc. cit.*, p. 144, pl. xii., fig. 1.
Emma buskii (Thomson), Harmer, 1923, *loc. cit.*, p. 357.

Attached to a red alga and bearing ovicells with larvae at Loc. 3. Also at Locs. 1 and 4.

Emma tricellata Busk, 1852.

Emma tricellata Busk, 1852, *loc. cit.*, p. 373. Harmer, 1923, *loc. cit.*, p. 357.

Locs. 3, 6.

Monartron cyathus (Thomson, 1858).

Menipea cyathus Thomson, 1858, Nat. Hist. Rev., v., p. 143, pl. xv., fig. 10.
Monartron cyathus (Thomson), Canu and Bassler, 1929, U.S. Nat. Mus. Bull., No. 100, ix., p. 224.

Loc. 1.

SCRUPOCELLARIA CYCLOSTOMA Busk, 1852.

Scrupocellaria cyclostoma Busk, 1852, *loc. cit.*, p. 370.

Locs. 2, 3.

SCRUPOCELLARIA SCRUPEA Busk, 1851.

Scrupocellaria scrupea Busk, 1851, Ann. Mag. Nat. Hist., ser. 2, vii., p. 83, pl. ix., figs. 11, 12.

At Loc. 2 a young colony of five zooecia was found attached to the basal surface of the lateral compartments of a zooecium of *Vittaticella dawsoni* (Thomson). The ancestrula, attached by a slender chitinous stalk equal in length to that of a zooecium, is bulbous, the membranous area being surrounded by seven slender hollow outgrowths. A chitinous joint separates the ancestrula from the second, third and succeeding zooecia. Also at Locs. 3, 6.

Family BICELLARIELLIDAE.

CORNUCOPINA GRANDIS (Busk, 1852).

Bicellaria grandis Busk, 1852, *loc. cit.*, p. 374.
Cornucopina grandis (Busk), Levinsen, 1909, *loc. cit.*, p. 110, pl. iv., figs. 5*a*–*c*.

Specimens were attached to *Cellaria setigera* Pergens, *Costaticella solida* (Levinsen) and to a sponge at Loc. 3.

DIMETOPIA CORNUTA Busk, 1852.

Dimetopia cornuta Busk, 1852, *loc. cit.*, p. 384, pl. i., figs. 7, 8.

Loc. 2.

DIMETOPIA HIRTA Macgillivray, 1886.

Dimetopia hirta Macgillivray, 1886, *loc. cit.*, p. 128.

Loc. 3.

DIMETOPIA BARBATA (Lamouroux, 1816).

Dynamena barbata Lamouroux, 1816, Hist. Polyp. Corall. Flex., p. 168.
Dimetopia spicata Busk, 1852, *loc. cit.*, p. 384, pl. i., fig. 9. Harmer, 1923, *loc. cit.*, p. 307.

Loc. 2.

Family BEANIIDAE.

BEANIA (DIACHORIS) MAGELLANICA (Busk, 1852).

Diachoris magellanica Busk, 1852, *loc. cit.*, p. 54, pl. lxvii.
Beania magellanica (Busk), Macgillivray, 1887, *loc. cit.*, p. 203.

Locs. 5, 7.

BEANIA (DIACHORIS) SPINIGERA (Macgillivray, 1860).

Diachoris spinigera Macgillivray, 1860, *loc. cit.*, p. 164.

This form was collected *in situ* at Loc. 6.

Suborder ASCOPHORA.

Family HIPPOTHOIDAE.

HIPPOTHOA DISTANS Macgillivray, 1869.

Hippothoa distans Macgillivray, 1869, *loc. cit.*, p. 130.

Loc. 6.

Family PETRALIIDAE.

Mucropetraliella ellerii (Macgillivray, 1869).

Lepralia ellerii Macgillivray, 1869, *loc. cit.*, p. 135.

Mucropetraliella ellerii (Macgillivray), Stach, 1936, Rec. Aust. Mus., xix. (6), p. 373, Text-figs. 14*a–c*.

Loc. 5.

Mucropetraliella nodulosa Stach, 1936.

Mucropetraliella nodulosa Stach, 1936, *loc. cit.*, p. 377, Text-figs. 18*a–b*.

Locs. 2, 6.

Family SCHIZOPORELLIDAE.

Subfamily SCHIZOPORELLINAE.

Schizobrachiella maplestonei (Macgillivray, 1879).

Schizoporella maplestonei Macgillivray, 1879, Prod. Zool. Vic., dec. iv, p. 24, pl. xxxv., fig. 7.

This form was bearing ovicells containing larvae at Loc. 6.

Schizomavella lata (Macgillivray, 1883).

Schizoporella lata Macgillivray, 1883, *loc. cit.*, p. 132, pl. i., fig. 7.

Loc. 6.

Schizoporella biturrita Hincks, 1884.

Schizoporella biturrita Hincks, 1884, Ann. Mag. Nat. Hist., ser. 5, xiv., p. 280.

Gephyrophora biturrita (Hincks), Canu and Bassler, 1920, *loc. cit.*, p. 521.

This form has been referred recently to *Gephyrophora* Busk, 1884, because of the form of the oral avicularia which, however, never meet across the aperture to form a spiramen in this species. Its affinities are with Canu and Bassler's group "*Schizopodrella*" (now a synonym of *Schizoporella* Hincks, 1877). Loc. 3.

Family SMITTINIDAE.

Mucronella diaphana (Macgillivray, 1879).

Lepralia diaphana Macgillivray, 1879, *loc. cit.*, p. 22, pl. xxxv., fig. 3.

Mucronella diaphana (Macgillivray), 1887, *loc. cit.*, p. 213.

This form was encrusting a laminate calcareous alga at Loc. 3 and bore ovicells containing larvae.

Family TUBUCELLARIIDAE.

Tubucellaria hirsuta (Lamouroux, 1816).

Cellaria hirsuta Lamouroux, 1816, *loc. cit.*, p. 126, pl. ii., fig. 4.

Tubucellaria hirsuta (Lamouroux), Stach, 1935, *loc. cit.*, p. 344, pl. xii., fig. 6.

Loc. 2.

Family RETEPORIDAE.

Iodictyum phoeniceum (Busk, 1854).

Retepora phœnicea Busk, 1854, *loc. cit.*, p. 94, pl. cxxi., figs. 1, 2.

Iodictyum phœniceum (Busk), Stach, 1936, Trans. Roy. Soc. South Aust., lx., p. 130.

Loc. 2.

Schizoretepora tessellata (Hincks, 1878).

Retepora tessellata Hincks, 1878, Ann. Mag. Nat. Hist., ser. 5, i., p. 358, pl. xix., figs. 9–12.

Schizoretepora tessellata (Hincks), Harmer, 1933, Proc. Zool. Soc., pt. 3, p. 619.

Loc. 2.

Sertella fissa (Macgillivray, 1869).

Retepora fissa Macgillivray, 1869, p. 140.

Loc. 5.

Triphyllozoon moniliferum (Macgillivray, 1860) (*sensu stricto*).

Retepora monilifera Macgillivray, 1860, *loc. cit.*, p. 168.

Triphyllozoon moniliferum (Macgillivray), Canu and Bassler, 1917, U.S. Nat. Mus. Bull., No. 96, p. 56.

Loc. 2.

Triphyllozoon umbonatum (Macgillivray, 1884).

Retepora monilifera form *umbonata* Macgillivray, 1884, *loc. cit.*, p. 107, pl. iii., fig. 5, pl. i., fig. 5.

Triphyllozoon cuspidatum Harmer, 1933, *loc. cit.*, p. 623.

Harmer (1933, p. 623) proposes the new name *Triphyllozoon cuspidatum* in place of *Retepora monilifera* var. *umbonata* Macgillivray, 1884, for no stated reason. Harmer's name is also not available for use in place of *Retepora umbonata* Buchner, 1924 (*non* Macgillivray, 1884) and must pass into the synonymy of *Triphyllozoon umbonatum.* It should also be noted that Art. 35 of the International Rules Zool. Nomen. does not permit the establishment of Harmer's new name, *Triphyllozoon apertum* for *Retepora monilifera* var. *sinuata* which he proposes because of Kirkpatrick's use of *Retepora sinuosa* in 1888. Apart from this, Macgillivray's name must stand since it has undoubted priority over that of Kirkpatrick. Loc. 2.

Family ADEONIDAE.

Adeona grisea Lamouroux, 1821.

Adeona grisea Lamouroux, 1821, Expos. Meth. Genres. Polyp., p. 40, pl. lxx., fig. 5.

Dictyopora grisea (Lamouroux), Macgillivray, 1882, Prod. Zool. Vic., dec. vii., p. 23. pl. lxvi., fig. 1.

Loc. 3.

ADEONELLOPSIS AUSTRALIS Macgillivray, 1886.
(Pl. XXII., Fig. 3.)

Adeonellopsis australis Macgillivray, 1886, *loc. cit.*, p. 135, pl. ii., figs. 2, 3. Stach, 1936, *loc. cit.*, p. 131, pl. xv., fig, 5.

Loc. 3.

LAMINOPORA DISPAR (Macgillivray, 1869).
(Pl. XXII., Fig. 4.)

Eschara dispar Macgillivray, 1869, *loc. cit.*, p. 138.

Loc. 3.

Family CELLEPORIDAE.

CELLEPORA LIRATA Macgillivray, 1888.

Cellepora lirata Macgillivray, 1888, Prod. Zool. Vic., dec. xvii., p. 250, pl. clxvii., fig. 3.

Loc. 3.

CELLEPORA MAGNIROSTRIS Macgillivray, 1888.

Cellepora magnirostris Macgillivray, 1888, *loc. cit.*, p. 251, pl. clxvii., fig. 4.

Loc. 3.

Family CATENICELLIDAE.

Subfamily VITTATICELLINAE.

VITTATICELLA BUSKII (Thomson, 1858).

Catenicella buskii Thomson, 1858, *loc. cit.*, p. 139, pl. xi., fig. 2.

Vittaticella buskii (Thomson), Maplestone, 1901, Proc. Roy. Soc. Vic., n.s., xiii. (2), p. 203.

Loc. 7.

VITTATICELLA CRYSTALLINA (Thomson, 1858).

Catenicella crystallina Thomson, 1858, *loc. cit.*, p. 139, pl. xiii., fig. 1.

Vittaticella crystallina (Thomson), Maplestone, 1901, *loc. cit.*, p. 203.

Loc. 2.

VITTATICELLA DAWSONI (Thomson, 1858).

Catenicella dawsoni Thomson, 1858, *loc. cit.*, p. 138, pl. xi., fig. 1.

Vittaticella dawsoni (Thomson), Maplestone, 1901, *loc. cit.*, p. 203.

Locs. 2, 3, 6.

VITTATICELLA ELEGANS (Busk, 1852).

Catenicella elegans Busk, 1852, *loc. cit.*, p. 361, pl. i., fig. 2.

Vittaticella elegans (Busk), Stach, 1934, Proc. Roy. Soc. Vic., n.s., xlvii. (1), p. 19, pl. iii., figs. 1–4.

Specimens from Loc. 3 bore ovicells. Also found at Loc. 7.

VITTATICELLA FORMOSA (Busk, 1852).

Catenicella formosa Busk, 1852, *loc. cit.*, p. 360.

Vittaticella formosa (Busk), Maplestone, 1901, *loc. cit.*, p. 202.

Loc. 7.

Subfamily SCUTICELLINAE.

Scuticella lorica (Busk, 1852).

Catenicella lorica Busk, 1852, *loc. cit.*, p. 358.
Scuticella lorica (Busk), Stach, 1934, *loc. cit.*, p. 23, Text-figs. 1–4.

Loc. 3.

Scuticella margaritacea (Busk, 1852).

Catenicella margaritacea Busk, 1852, *loc. cit.*, p. 356.
Scuticella margaritacea (Busk), Levinsen, 1909, *loc. cit.*, p. 229.

Specimens from Loc. 3 bore ovicells with larvae. Also found at Locs. 1, 7.

Scuticella plagiostoma (Busk, 1852).

Catenicella plagiostoma Busk, 1852, *loc. cit.*, p. 358.
Scuticella plagiostoma (Busk), Stach, 1934, *loc. cit.*, p. 15. Text-fig. 8.

Loc. 2.

Costaticella hastata (Busk, 1852).

Catenicella hastata Busk, 1852, *loc. cit.*, p. 355.
Costaticella hastata (Busk), Livingstone, 1929, *loc. cit.*, p. 97.

Loc. 2.

Costaticella solida (Levinsen, 1909).

Costicella solida Levinsen, 1909, *loc. cit.*, p. 234, pl. xx. fig *7a*, pl. xii., figs. 1*h*, *k*.
Costaticella solida (Levinsen), Stach, 1934, *loc. cit.*, p. 17, Text-fig. 4.

Specimens from Loc. 3 bore ovicells containing larvae and were attached to a red alga. Also found at Locs. 2, 7.

Calpidium ponderosum (Goldstein, 1880).

Catenicella ponderosa Goldstein, 1880, Journ. Micro. Soc. Vic., i. (2, 3), p. 63, pl. v., figs. 1–3.
Calpidium ponderosum (Goldstein), Canu and Bassler, 1929, *loc. cit.*, p. 451, Text-figs. 183*I–P*.

Locs. 2, 3.

Cribricellina cribraria (Busk, 1852).

Catenicella cribraria Busk, 1852, *loc. cit.*, p. 359.
Cribricellina cribraria (Busk), Stach, 1934, *loc. cit.*, p. 42.

Locs. 2, 3.

Subfamily CATENICELLINAE.

Claviporella imperforata Macgillivray, 1887.

Claviporella imperforata Macgillivray, 1887, *loc. cit.*, p. 65, pl. i., fig. 3.

Loc. 1.

Pterocella alata (Thomson, 1858).

Catenicella alata Thomson, 1858, *loc. cit.*, p. 137, pl. xiii., fig. 4.
Pterocella alata (Thomson), Stach, 1935, Proc. Roy. Soc. Vic., n.s., xlviii. (1), p. 27.

Loc. 2.

PTEROCELLA GEMELLA (Macgillivray, 1887).

Catenicella gemella Macgillivray, 1887, *loc. cit.*, p. 64, pl. i., fig. 1.
Loc. 2.

Order CTENOSTOMATA.

Family VESICULARIIDAE.

AMATHIA PLUMOSA Macgillivray, 1890.

Amathia plumosa Macgillivray, 1890, *loc. cit.*, p. 110.
Locs. 3, 6.

CRYPTOPOLYZOON WILSONI (Dendy, 1889).

Cryptozoon wilsoni Dendy, 1889, Proc. Roy. Soc. Vic., n.s., i.
Cryptopolyzoon wilsoni (Dendy), 1900, Zool. Anzeiger, xxiii., p. 391.
Locs. 3, 7.

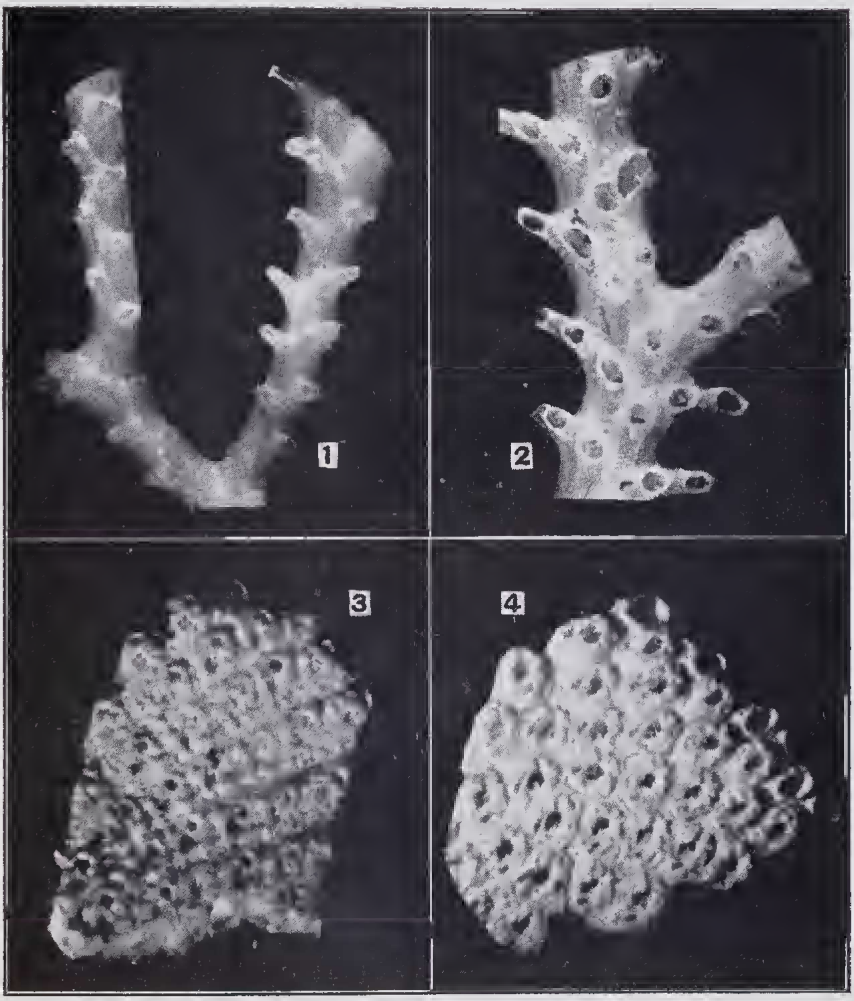
Explanation of Plate XXII.

Fig. 1.—*Idmonea atlantica* Forbes. Kvaenangsfjord, Tromso (Norway). Plesiotype, Nat. Mus. Coll. No. 70072.

Fig. 2.—*Idmonea australis* Macgillivray. From debris in the joint planes of the basalt at McCoy Platform. Plesiotype, Nat. Mus. Coll. No. 70073.

Fig. 3.—*Adeonellopsis australis* Macgillivray. From 25 fathoms off West Cape. Plesiotype, Nat. Mus. Coll. No. 70074.

Fig. 4.—*Laminopora dispar* (Macgillivray). From 25 fathoms off West Cape. Plesiotype, Nat. Mus. Coll. No. 70075.



Bryozoa of Lady Julia Percy Island.

14. *Mollusca.*

By F. A. SINGLETON.

Owing to the uniformly rocky nature of the coastline of Lady Julia Percy Island and the heavy seas which sweep it, conditions are unfavourable for molluscs, which are virtually restricted to some of the commoner littoral and sub-littoral gasteropods and a few chitons. The number of species is therefore very limited in comparison with that of the adjacent mainland, but probably further collecting would add to the 46 listed below, which include littoral forms taken alive, and sub-littoral shells washed into rock pools.

Most of the shells are from Dinghy Cove (1), chiefly from the rock pool near the landing, and West Cape (2), from rock pools on the northern side. A few dead shells, cast up by storm waves, were found in crevices on McCoy Platform (3). The only other accessible portions of the coast, from which a few shells were obtained, are at Seal Cave (4) and Pinnacle Point (5), at either end of Seal Bay. In the absence of dredging, the shallow water fauna is represented only by a few shells from off West Cape, in 25 fathoms (6), obtained upon drawing up an anchor.

No land or freshwater shells were found.

I am indebted to Messrs. B. C. Cotton, C. J. Gabriel and G. Mack for assistance with comparative material. The specimens on which the determinations are based have been lodged in the National Museum, Melbourne.

Class PELECYPODA.

Family ARCIDAE.

BARBATIA PISTACHIA (Lamarck, 1819).

Arca pistachia Lamarck, Anim. s. Vert., vi., 1819, p. 41.
Barbatia pistachia (Lamarck). Gatliff and Gabriel, Proc. Roy. Soc. Vic., n.s., xliii. (2), 1931, p. 230.

Loc. 2, one example.

Family LIMOPSIDAE.

LIMOPSIS cf. TENISONI T. Woods, 1878.

Limopsis tenisoni Ten. Woods, Pap. Proc. Roy. Soc. Tas., 1877 (1878), p. 56. Pritchard and Gatliff, Proc. Roy. Soc. Vic., xvii. (1), 1904, p. 245. Verco, Trans. Roy. Soc. S. Aust., xxxi., 1907, p. 218.

Loc. 6, one juvenile.

Family LIMIDAE.

LIMATULA STRANGEI (Sowerby, 1872).

Lima strangei Sowerby, Conch. Icon., xviii., 1872, pl. iii., fig. 15. Hedley, Proc. Linn. Soc. N.S.W., xlviii., 1923, p. 302.
Lima (Limatula) bullata Born. Pritchard and Gatliff, *loc. cit.*, p. 260.

Loc. 6, one dead valve.

Family MYTILIDAE.

Modiolus pulex Lamarck, 1819.

Modiola pulex Lamarck, Anim. s. Vert., vi., 1819, p. 112. Gatliff and Gabriel, Proc. Roy. Soc. Vic., xxx. (1), 1917, p. 30.

Locs. 1, 2, 5, not uncommon.

Class AMPHINEURA.

Family ISCHNOCHITONIDAE.

Ischnochiton elongatus (Blainville, 1825).

Chiton elongatus Blainville, Dict. Sci. Nat., xxxvi., 1825, p. 542.

Ischnochiton crispus Reeve. Pritchard and Gatliff, Proc. Roy. Soc. Vic., xv. (2), 1903, p. 200.

Ischnochiton elongatus elongatus. Iredale and Hull, Monograph Aust. Loricates, 1927, p. 11, pl. i., figs. 1, 1*a*.

Common under stones in rock pools, Locs. 1 and 2.

Ischnochiton atkinsoni Iredale and May, 1916.

Ischnochiton atkinsoni Iredale and May, Proc. Mal. Soc. Lond., xii., 1916, p. 110, pl. iv., fig. 3. Gatliff and Gabriel, Proc. Roy. Soc. Vic., xxx. (1), 1917, p. 25. Iredale and Hull, *op. cit.*, p. 20, pl. ii., figs. 3, 3*a*, *b*.

With the preceding. Locs. 1 and 2.

Ischnoradsia evanida novaehollandiae (Reeve, 1847).

Chiton novaehollandiae Reeve, Conch. Icon., iv., 1847, pl. xxi., fig. 142.

Ischnoradsia evanida novaehollandiae, Iredale and Hull, *op. cit.*, p. 35.

Ischnoradsia australis (Sowerby). Gatliff and Gabriel (*non* Sowb.), Proc. Roy. Soc. Vic., xliii. (2), 1931, p. 219.

Not definitely localized, but from Loc. 1 or 2.

Family PLAXIPHORIDAE.

Poneroplax costata (Blainville, 1825).

Chiton costatus Blainville, Dict. Sci. Nat., xxxvi., 1825, p. 548.

Poneroplax costata. Iredale and Hull, *op. cit.*, p. 100, pl. xii., figs. 1, 9, 10.

Poneroplax costatus (Blainville). Gatliff and Gabriel, *loc. cit.*, 1931, p. 225.

On rocks in its usual station between tide marks. Locs. 1 and 2.

Class GASTEROPODA.

Family FISSURELLIDAE.

Scutus antipodes Montfort, 1810.

Scutus antipodes Montfort, Conch. Syst., ii., 1810, p. 59, pl. xv. Gatliff and Gabriel, Proc. Roy. Soc. Vic., xxxiv., 1922, p. 151.

Two living examples. Loc. 2.

MONTFORTULA RUGOSA (Quoy and Gaimard, 1834).

Emarginula rugosa Quoy and Gaimard, Astrolabe Zool., iii., p. 331, pl. lxviii., figs. 17, 18.

Subemarginula rugosa Q. and G. Pritchard and Gatliff, Proc. Roy. Soc. Vic., xv. (2), 1903, p. 187.

Emarginula (*Montfortula*) *rugosa* Q. and G. Cotton and Godfrey, S. Aust. Naturalist, xv. (2), 1934, p. 45, pl. i., fig. 5.

Iredale (P.L.S.N.S.W., xlix. (3), 1924, p. 216) has discussed differences from Peronian shells of Port Fairy examples of this and the preceding species. Locs. 2, 5.

Family HALIOTIDAE.

HALIOTIS (NOTOHALIOTIS) NAEVOSUM Martyn, 1784.

Haliotis naevosa Martyn, Univ. Conch., ii., 1784, pl. lxiii. Pritchard and Gatliff, *loc. cit.*, 1903, p. 178.

Haliotis (*Notohaliotis*) *naevosa* Martyn. Cotton and Godfrey, S. Aust. Naturalist, xv. (1), 1933, pp. 16, 17, pl. i., fig. 4.

Iredale (*loc. cit.*, p. 222) has proposed a subspecies *improbulum*, not here adopted, for Port Fairy shells. Loc. 1, common.

Family TROCHIDAE.

CLANCULUS (MESOCLANCULUS) PLEBEJUS (Philippi, 1851).

Trochus plebejus Philippi, Zeit. Malak., viii., 1851, p. 41.

Clanculus plebeius Philippi. Pritchard and Gatliff, Proc. Roy, Soc. Vic., xiv. (2), 1902, p. 122.

Mesoclanculus plebejus (Philippi). Iredale, Proc. Linn. Soc. N.S.W., xlix. (3), 1924, p. 224.

Loc. 1, common under stones.

AUSTROCOCHLEA CONCAMERATA (Wood, 1828).

Trochus concameratus Wood, Index Test., suppl., 1828, pl. vi., fig. 35.

Monodonta concamerata (Wood). Gatliff and Gabriel, Proc. Roy. Soc. Vic., xliii. (2), 1931, p. 214.

Austrocochlea concamerata Wood. Cotton and Godfrey, S. Aust. Nat., xvi. (1), 1934, p. 3, pl. i., fig. 3.

Loc. 1, common.

CHLORODILOMA ADELAIDAE (Philippi, 1849).

Trochus adelaidae Philippi, Conch. Cab., ii., 1849, p. 140, pl. xxiv., fig. 1.

Diloma adelaidae Philippi. Pritchard and Gatliff, Proc. Roy. Soc. Vic., xiv. (2), 1902, p. 125.

Austrocochlea (*Chlorodiloma*) *adelaidae* Phil. Cotton and Godfrey, S. Aust. Nat., p. 5, pl. i., fig. 5.

Loc. 1, common.

FOSSARINA PETTERDI Crosse, 1870.

Fossarina petterdi Crosse, Journ. de Conch., 1870, p. 303. Pritchard and Gatliff, Proc. Roy. Soc. Vic., xiv. (2), 1902, p. 49. Cotton and Godfrey, S. Aust. Nat., xvi. (3), 1935, p. 39.

On seaweed in rock pools, Loc. 2.

Family TURBINIDAE.

Astraea aurea (Jonas, 1844).

Trochus aureus Jonas, Zeits. Malak., 1844, p. 168.

Astralium aureum Jonas. Pritchard and Gatliff, Proc. Roy. Soc. Vic., 1902, p. 118.

Loc. 1.

Turbo (Lunella) undulatus (Martyn, 1784).

Limax undulatus Martyn, Univ. Conch., i., fig. 29.

Turbo undulatus Martyn. Pritchard and Gatliff, *loc. cit.*, 1902, p. 114.

Locs. 1 and 2.

Family ACMAEIDAE.

Patelloida alticostata (Angas, 1865).

Patella alticostata Angas, Proc. Zool. Soc. Lond., 1865, p. 56.

Patelloida (Patelloida) alticostata (Angas). Oliver, Trans. N.Z. Inst., lvi., 1926, p. 550.

Patelloida alticostata (Angas). Gatliff and Gabriel, Proc. Roy. Soc. Vic., xliii. (2), 1931, p. 216.

Much larger and more elevated than Port Phillip examples. Locs. 1, 2, 5, common.

Patelloida (Collisellina) latistrigata (Angas, 1865).

Patella latistrigata Angas, *op. cit.*, p. 154.

Patelloida (Collisellina) latistrigata (Angas). Oliver, *loc. cit.*, p. 556.

Patelloida marmorata (Tenison-Woods). Gatliff and Gabriel, *loc. cit.*, p. 216.

Locs. 1 and 2.

Notoacmea mayi (May, 1923).

Patelloida mayi May, Illust. Index Tas. Shells, 1923, Appendix, p. 100, for pl. xxii., No. 3, *P. cantharus*, not of Reeve.

Notoacmea (Notoacmea) mayi May. Oliver, *loc. cit.*, p. 571.

This is apparently the correct name for the species which appears in the Gatliff collection, now in the National Museum, Melbourne, as *Patelloida cantharus* Reeve. Loc. 2.

Chiazacmea flammea (Quoy and Gaimard, 1834).

Patelloida flammea Quoy and Gaimard, Astrolabe Zool., iii., 1834, p. 354.

Acmaea flammea Q. and G. Pritchard and Gatliff, Proc. Roy. Soc. Vic., xv. (2), 1903, p. 196.

Chiazacmea flammea Q. and G. Oliver, *loc. cit.*, p. 558.

A tall form which may be included in this variable species. Locs. 1 and 2.

Family PATELLIDAE.

Patella peronii Blainville, 1825.

Patella peronii Blainville, Dict. Sci. Nat., xxxvi., 1825, p. 111. Iredale, Proc. Linn. Soc. N.S.W., xlix. (3), 1924, p. 241.

Patella ustulata Reeve. Pritchard and Gatliff, *loc. cit.*, 1903, p. 193.

Locs. 1 and 2, common.

PATELLA VICTORIANA, sp. nov. (Pl. XXIII., Fig. 1).

Patella hepatica Pritchard and Gatliff, *loc. cit.*, 1903, p. 194. Verco, Trans. Roy. Soc. S. Aust., xxx., 1906, p. 207, and xxxi., 1907, p. 99. Iredale, *loc. cit.*, 1924, p. 240.

Patella victoriae Gatliff and Gabriel, Proc. Roy. Soc. Vic., xxxiv., 1922, p. 152.

Iredale has pointed out that these two names are technically unavailable for the Victorian shell, which Verco regarded as an extreme variant of *ustulata* Reeve, since their only status is as substitute names for *Acmaea striata* Pilsbry (*non* Quoy and Gaimard), a Celebes shell of different shape.

I therefore describe as a new species a Victorian shell from the Gatliff collection, now in the National Museum, Melbourne.

Holotype.—Shell elongate ovate, moderately elevated, anterior slope 47 deg., posterior slope 26 deg., nearly flat; sculptured by about 100 depressed subequal radiating riblets, increasing by division, crossed by fine lines of growth, interspaces almost linear. Apex subacute, slightly eroded, pointing anteriorly, situate in the anterior third of the shell. Colour dark brown, the interior white to bluish-white, with brown margin.

Length 23.5, breadth 17.7, height 7.7 mm.

Paratype.—This differs in being broader and higher, with the apex nearer the anterior margin; anterior slope 54 deg., posterior slope convex. The better preserved internal margin is weakly denticulated by the termination of the external riblets.

Length 23.7, breadth 18.9, height 8.5 mm.

Holotype and paratype (Reg. Nos. 70,069-70) in the National Museum, Melbourne.

The material available to the writer does not confirm Verco's contention that the shells long known as *hepatica* intergrade with *ustulata* (i.e., *peronii*). Whether the differences are specific or ultimately prove to be subspecific, a distinctive name is desirable for this uniformly sculptured shell, whose brown to greenish brown coloration, usually with a white patch due to apical wear, is characteristic.

In outline it varies from the oblong-oval form noted by Verco, which is that occurring at Lady Julia Percy Island, to a more roundly elliptical form which is commoner in Victoria.

Loc. 2, rare.

PATELLA (PATELLANAX) SQUAMIFERA Reeve, 1855.

Patella squamifera Reeve, Conch. Icon., viii., 1855, pl. xxxii., fig. 94. Gatliff and Gabriel, *op. cit.*, 1922, p. 152. Iredale, *op. cit.*, 1924, p. 239.

Loc. 2.

CELLANA VARIEGATA (Blainville, 1825).

Patella variegata Blainville, Dict. Sci. Nat., xxxviii., 1825, p. 10.
Cellana variegata Blainville. Gatliff and Gabriel, Proc. Roy. Soc. Vic., 1922, p. 152.
Cellana variegata ariel Iredale, Proc. Linn. Soc. N.S.W., xlix. (3), 1924, p. 242.

Iredale has noted in a series from Port Fairy two forms: one with flattened ribs, eroded apex and lighter coloration; the other very dark, with sharper cut ribs and little erosion. These were stated to come from sandstone [i.e., dune limestone] and basalt rocks respectively, but the first occurs also on basalt both at Port Fairy and at Lady Julia Percy Island, where it is accompanied by the less common second form.

The distinction between these two forms merits recognition far more than that between the whole Port Fairy series, which Iredale has distinguished subspecifically, and those from Port Phillip Heads easterly, which the writer is unable to separate.

Abundant and of large size. Locs. 1 and 2.

Family LITTORINIDAE.

MELARHAPHE UNIFASCIATA (Gray, 1826).

Littorina unifasciata Gray, King's Survey Aust., ii., 1827, App., p. 483.
Melarhaphe unifasciata Gray. Gatliff and Gabriel, Proc. Roy. Soc. Vic., xxxiv., 1922, p. 145.

Abundant on rocks, up to 30 feet above high water mark. Locs. 1, 2, 3.

MELARHAPHE PRAETERMISSA (May, 1909).

Littorina novaezelandiae Reeve. Pritchard and Gatliff (*non* Reeve). Proc. Roy. Soc. Vic., xiv. (2), 1902, p. 91.
Littorina praetermissa May, Pap. Roy. Soc. Tas. for 1908, 1909, p 57, pl. vi., fig. 3.

May's name, given to a Tasmanian shell, is adopted in view of the uncertainty attaching to Reeve's species, which apparently did not come from New Zealand.

Locs. 1, 2, 5, common.

Family RISSOIDAE.

RISSOINA ELEGANTULA Angas, 1880.

Rissoina elegantula Angas, Proc. Zool. Soc. Lond., 1880, p. 417. pl. xl., fig. 10. Pritchard and Gatliff, *loc. cit.*, 1902, p. 110.

Loc. 6, one example.

Family CAPULIDAE.

CAPULUS AUSTRALIS (Lamarck, 1819).

Patella australis Lamarck, Anim. s. Vert., vi. (1), 1819, p. 335.
Hipponyx australis Lamarck. Pritchard and Gatliff, Proc. Roy. Soc. Vic., xii. (2), 1900, p. 198.
Capulus australis (Lamarck). Iredale, Proc. Linn. Soc. N.S.W., xlix. (3), 1924, p. 245.

Loc. 1, on *Haliotis*.

Family EPITONIIDAE.

OPALIA AUSTRALIS (Lamarck, 1822).

Scalaria australis Lamarck, Anim. s. Vert., vi., 1822, p. 228.

Scala australis Lamarck. Pritchard and Gatliff, Proc. Roy. Soc. Vic., xiii. (1), 1900, p. 142.

Opalia australis Lamarck. Cotton and Godfrey, S. Aust. Nat., xiii. (1), 1931, p. 7, pl. i., fig. 4.

Loc. 1, one dead shell.

Family CYMATIIDAE.

CYMATIELLA VERRUCOSA (Reeve, 1844).

Triton verrucosus Reeve, Proc. Zool. Soc. Lond., 1844, p. 118.

Lotorium verrucosum Reeve. Pritchard and Gatliff, Proc. Roy. Soc. Vic., x. (2), 1898, p. 265.

Cymatiella verrucosa Reeve. Iredale, Rec. Aust. Mus., xvii. (4), 1929, p. 175, pl. xl., fig. 2.

Loc. 3, one example.

Family CYPRAEIDAE.

NOTOCYPRAEA cf. COMPTONII (Gray, 1847).

Cypraea comptonii Gray, Jukes' Voy. "Fly," ii., 1847, App., p. 356, pl. i., fig. 3.

Cypraea angustata Gmelin, var. *comptoni* Gray. Pritchard and Gatliff, Proc. Roy. Soc. Vic., xii. (2), 1900, pp. 183, 185.

Notocypraea comptoni Gray. Cotton and Godfrey, S. Aust. Nat., xiii. (2), 1932, p. 42. Iredale, Aust. Zool., viii. (2), 1935, p. 134.

This is the form usually listed as *comptoni*, but Iredale has shown its applicability to Southern Australian shells to be doubtful.

Loc. 1, one dead shell. Loc. 2, two living examples.

NOTOCYPRAEA VERCONIS Cotton and Godfrey, 1932.

Cypraea angustata Gmelin. Pritchard and Gatliff (*non* Gmel.), *loc. cit.*, 1900, p. 183.

Notocypraea verconis Cotton and Godfrey, *loc. cit.*, 1932, p. 41, pl. i., fig. 8.

Loc. 1, one dead shell.

Family MARGINELLIDAE.

MARGINELLA (GLABELLA) PYGMAEOIDES, sp. nov. (Plate XXIII., Fig. 2).

"*Marginella pygmaea* Sowerby." Pritchard and Gatliff, *op. cit.*, xi. (2), 1898, p. 191. May., Ill. Ind. Tas. Shells, 1923, pl. xxxi., fig. 9. Not *M. pygmaea* Sowerby, Thes. Conch., i., 1846, p. 386, pl. lxxv., figs. 78, 79.

Marginella (*Glabella*) aff. *pygmaea*. Powell, Trans. N.Z. Inst., lxii., 1932, p. 205, pl. xxxiv., fig. 19.

Holotype.—Shell small, solid, volutiform, smooth except for faint growth lines, shining, creamy white. Spire low, about a quarter length of aperture, bluntly conical, spire angle about 72 deg. Protoconch broadly convex, smooth. Whorls 4, sutures indistinct, spire whorls slightly convex, body whorl large, moderately convex, narrowed anteriorly. Aperture long, channelled and slightly bent posteriorly, widening anteriorly. Outer lip thickened, interior smooth, exterior with a weak varix. Columella oblique, nearly straight, with 4 prominent subequidistant and closely spaced plaits; the three lower stout, oblique, the uppermost thinner and more transverse, at little more than a third the height of the body whorl.

Height 8.5 mm., diameter 5.0 mm.

Port Phillip, Victoria. Gatliff Collection, National Museum, Melbourne, Reg. No. 70071.

The credit for the recognition of the distinction between New Zealand *pygmaea* and Tasmanian shells ascribed to Sowerby's species belongs to Powell, who (*loc. cit.*) has figured shells from both countries and remarked "Tasmanian shells ascribed to *pygmaea* differ from the here assumed typical New Zealand species in having stronger and more closely spaced plaits, the uppermost situated proportionately lower in relation to the height of the body-whorl. The spire also is less blunt, and the labial varix not so high," but refrained from naming the Tasmanian form, since he had not access to Sowerby's original figure, which, as he surmised, represents the New Zealand species.

Powell has recorded a sinistral example from Swansea, Tasmania: another, from Portsea, Victoria, is in the Gatliff Collection.

M. pygmaeoides is apparently confined to Tasmania, where it is widespread, and Victoria, whence Pritchard and Gatliff have recorded it (as *pygmaea*) from Port Phillip and Western Port and from Portland (one example).

Loc. 3, one example.

Family CANCELLARIIDAE.

Cancellaria lactea Deshayes, 1832.

Cancellaria lactea Deshayes, Encyc. Meth., iii., 1832, p. 180.
Cancellaria laevigata Sowerby. Pritchard and Gatliff, Proc. Roy. Soc. Vic., xi. (2), 1899, p. 205.

Loc. 1, one dead shell.

Family CONIDAE.

Conus (Floraconus) anemone Lamarck, 1810.

Conus anemone Lamarck, Ann. du Mus., xv., 1810, p. 272. Pritchard and Gatliff, Proc. Roy. Soc. Vic., xii. (2), 1900, p. 180.
Floraconus anemone Lamarck. Cotton and Godfrey, S. Aust. Nat., xiii. (2), 1932, p. 68, pl. iii., fig. 12.

Loc. 2, alive. Loc. 3, dead shells.

Family FASCIOLARIIDAE.

Fasciolaria (Pleuroploca) australasia coronata Lamarck, 1822.

Fasciolaria coronata Lamarck, Anim. s. Vert., vii., 1822, p. 120. Pritchard and Gatliff, Proc. Roy. Soc. Vic., x. (2), 1898, p. 271.

Loc. 2, badly worn shells.

Family BUCCINIDAE.

Cominella lineolata Lamarck, 1809.

Buccinum lineolatum Lamarck, Encyc. Meth., i., 1809, pl. 400, fig. 8.
Cominella lineolata Lamarck. Pritchard and Gatliff, *loc. cit.*, 1898, p. 275.

Loc. 1, abundant.

Family COLUBRARIIDAE.

Colubraria reticulata (A. Adams, 1854).

Pisania reticulata A. Adams, Proc. Zool. Soc. Lond., 1854, p. 138. Pritchard and Gatliff, *loc. cit.*, 1898, p. 274.
Fusus mestayerae Iredale, Trans. N.Z. Inst., xlvii., 1915, p. 466. Gatliff and Gabriel, Proc. Roy. Soc. Vic., xxxiv., 1922, p. 132.
Colubraria reticulata A. Ad. Cotton and Godfrey, S. Aust. Nat., xvi. (2), 1935, p. 24.

Loc. 1, one dead shell.

Family PYRENIDAE.

Pyrene semiconvexa (Lamarck, 1822).

Buccinum semiconvexum Lamarck, Anim. s. Vert., vii., 1822, p. 272.
Columbella semiconvexa Lamarck. Pritchard and Gatliff, Proc. Roy. Soc. Vic., xi. (2), 1899, p. 197.
Pyrene semiconvexa Lamarck. Cotton and Godfrey, S. Aust. Nat., xiii. (3), 1932, p. 102, pl. i., fig. 8.

Loc. 3, one example.

Family THAIDIDAE.

Neothais textiliosa (Lamarck, 1822).

Purpura textiliosa Lamarck, *loc. cit.*, 1822, p. 77.
Neothais textiliosa Lamarck. Cotton and Godfrey, S. Aust. Nat., xiii. (4), 1932, p. 142, pl. i., fig. 14.

Pritchard and Gatliff (P.R.S.Vic., x. (2), 1898, p. 258) included this with the Peronian *P. succincta* Martyn.

Locs. 1 and 2, abundant.

Lepsithais vinosa aurea (Hedley, 1915).

Kalydon vinosus Lamarck, var. *aurea* Hedley, Proc. Linn. Soc. N.S.W., xxxix. (4), 1915, p. 748.
Lepsiella vinosa Lamarck. Gatliff and Gabriel, Proc. Roy. Soc. Vic., xxxiv., 1922, p. 131 (in part).
Lepsithais vinosa Lamarck. Cotton and Godfrey, S. Aust. Nat., 1932, p. 144 (in part).

Locs. 1 and 2.

Family ELLOBIIDAE.

Marinula xanthostoma H. and A. Adams, 1854.

Marinula xanthostoma H. and A. Adams, Proc. Zool. Soc. Lond., 1854, p. 35. Cotton and Godfrey, S. Aust. Nat., xiii. (4), 1932, p. 147, pl. iii., fig. 1.
Marinula patula Lowe. Gatliff (*non* Lowe), Vic. Nat., xxii. (1), 1905, p. 16.

Loc. 4, one example.

Family SIPHONARIIDAE.

Siphonaria diemenensis Quoy and Gaimard, 1833.

Siphonaria diemenensis Quoy and Gaimard, Astrolabe Zool., ii., 1833, p. 327, pl. xxv., figs. 1–12. Pritchard and Gatliff, Proc. Roy. Soc. Vic., xv. (2), 1903, p. 220.

Locs. 1, 2, 5, common near high tide mark.

Siphonaria tasmanica T. Woods, 1877.

Siphonaria denticulata var. *tasmanica* Tenison Woods, Pap. Roy. Soc. Tas. for 1876-1877, p. 54.

Siphonaria zonata T. Woods. Pritchard and Gatliff, *loc. cit.*, p. 221.

The interior is darker than is usual in this species. Loc. 2, less common than the preceding.

Family TETHYIDAE.

Tethys norfolkensis (Sowerby, 1869).

Aplysia norfolkensis Sowerby, Conch. Icon., xvii., 1869, pl. x, fig. 42.

Tethys norfolkensis Sowerby. Hedley, Proc. Linn. Soc. N.S.W., xxx. (4), 1906, p. 536, pl. xxiii., figs. 33, 34 (animal). Cotton and Godfrey, S. Aust. Nat., xiv. (3), 1933, p. 96, pl. i., fig. 21 (shell).

Loc. 2, alive in rock pools.

Explanation of Plate XXIII.

Fig. 1. *Patella victoriana*, sp. nov. Holotype. Victoria. Nat. Mus., Melb., Reg. No. 70,069.

Fig. 2 *a, b. Marginella pygmaeoides*, sp. nov. Holotype. Port Phillip, Victoria. Nat. Mus., Melb., Reg. No. 70071.

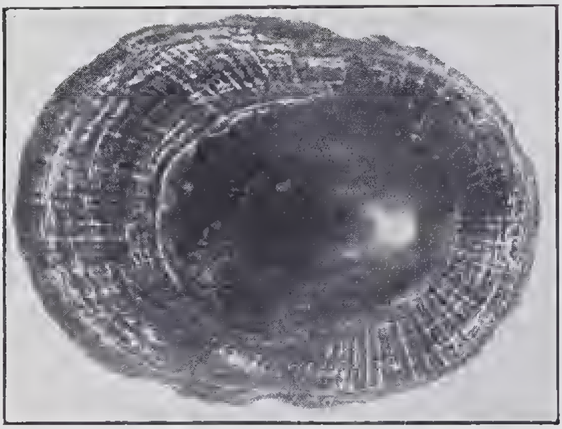


FIG. 1.

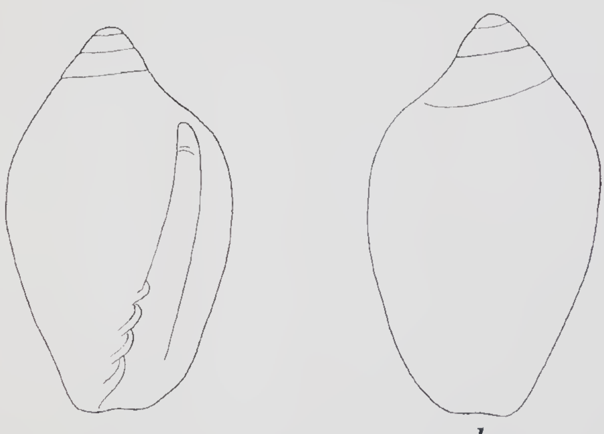


FIG. 2.

15. *Insecta.*

By A. DUNBAVIN BUTCHER.

Family BLATTIDAE.

Onicosoma granicollis Sauss.
Calolampa irrorata Fabricius.
Platyzostera sp.

Family OLIGOTOMIDAE.

Oligotoma gurneyi Froggatt

Family LYGAEIDAE.

Nysius vinitor Bergroth.

Family MEMBRACIDAE.

Acanthucus gracilispinus Stahl.

Family TENEBRIONIDAE.

Saragus infelix Pascoe.

Family SCARABAEIDAE.

Aphodius howitti Hope.
Phyllotocus bimaculatus Erichson.
Cheiroplatys modelius Erichson.

Family LAMPYRIDAE.

Calachromus insidiator Fairmaire.

Family OEDIMERIDAE.

Copidita puncta McLeay.

Family COCCINELLIDAE.

Coccinella transversalis Fabricius.

Family BYRRHIDAE.

Microchaetes sphaericus Hope.

Family PTINIDAE.

Ptinus exulans Erichson.

Family SPHECIDAE.

Ammophila suspiciosa Smith.

Family FORMICIDAE.

Pheidole gellibrandi Clark.
Monomorium (Notomyrmex) rubriceps var. *cincta* Wheeler.
Iridomyrmex bicknelli Emery.
Iridomyrmex punctatissima Emery.
Iridomyrmex vicina Clark.

Family CALLIPHORIDAE.

Calliphora (?) *stygia* Fabricius.
Calliphora sp.
Chrysomia sp.

Family MUSCIDAE.

Musca (?) *domestica* Linnaeus.

Family NOCTUIDAE.

Peripyra sanguinipuncta (Guenée).
Agrotis spina Guenée.
Euxoa porphyricollis Guenée.
Euxoa radians Guenée.
Proteuxoa aspersa Walker.
Proteuxoa mundoides Lower.
Idiodes apicata Guenée.
Siderides unipuncta (Haworth).
Plusia argentifera Guenée.

Family GEOMETRIDAE.

Euchoeca rubropunctaria (Doubleday).
Xanthorhoe subochraria (Doubleday).
Xanthorhoe subidaria (Guenée).

Family TORTRICIDAE.

Tortrix postvittana (Walker).
Nyctemera annulata (Boisduval).

Family NYMPHALIDAE.

Heteronympha merope Fabricius.
Pyrameis cardui kershawi McCoy.

Representatives of the following families also were found:—

PHASMIDAE; GRYLLIDAE; ACRIDIIDAE (*Paragryllacris* sp.); LABIDURIDAE; REDUVIIDAE; COCCIDAE (*Mytilaspis* sp.); CURCULIONIDAE (*Storeus* sp.); BRACONIDAE; CHALCIDAE; ENCYRTIDAE; PSAMMOCHARIDAE (*Pseudogenia* sp.); ANDRENIDAE (*Nomia* sp.); HIPPOBOSCIDAE; CHLOROPIDAE (*Parahippletes* sp.); NEOTTIOPHILIDAE (*Tapeigaster* sp.); BOMBYLIDAE (*Villa* sp.); CULICIDAE (*Aedes* (*Ocklerolatus*) sp.).

Thanks are due to J. Clark, National Museum, Melbourne, for identifying the Formicidae; to H. F. Consett Davis, Sydney University, for identifying the Embiaria, and to F. H. Taylor, School of Public Health and Tropical Medicine, Sydney, for determining the Diptera.

16. *Cestoda.*

By F. H. DRUMMOND.

The collection of cestodes was small, only five species being represented. Of these, two have not been described previously, and another is also new, but lack of material has rendered an adequate description impossible.

Order TETRAPHYLLIDEA.

Family PHYLLOBOTHRIIDAE.

PHYLLOBOTHRIUM MUSTELI (van Beneden, 1850).

Anthobothrium musteli van Beneden, 1850, Mem. Acad. Roy. Sci. Belg., xxv., p. 126, pl. v.

Phyllobothrium musteli (van Beneden), Southwell, 1925, Mem. Liverpool School Trop. Med., n.s., ii., p. 173.

Numerous specimens were taken from the spiral valve of a gummy shark (*Mustelus antarcticus*). This cestode has been fully described by Yoshida (1917, Parasitology, ix.).

PHYLLOBOTHRIUM THRIDAX (van Beneden, 1850).

Phyllobothrium thridax van Beneden, 1850, *loc. cit.*, p. 122, pl. v.

Phyllobothrium thridax (van Beneden), Southwell, 1925, *loc. cit.*, p. 154.

The material consisted of a single specimen from the spiral valve of a Port Jackson shark (*Heterodontus philippi*).

Family ONCHOBOTHRIIDAE.

ACANTHOBOTHRIUM HETERODONTI, n. sp.
(Plate XXIV., Figs. 1–3.)

The description of this species is based on two specimens found in the spiral valve of *Heterodontus philippi*.

External features.—The longer of the two specimens measured 54 cm. mounted in balsam. The segments number several hundred, and posteriorly attain a length of 2.7 mm. and a breadth of 2.0 mm. The last segments were not gravid. The lateral genital pores are irregularly alternate, and slightly posterior to the middle of the segment.

The four bothridia are each divided into three loculi. The total length of a bothridium is 1.2 mm., the anterior loculus measuring 0.6 mm. and the other two about 0.3 mm. each. In front of each bothridium there is a pair of bifurcated hooks. The longer inner prong, which has a tubercle at its base, has a total length of 0.3 mm. and the outer prong measures 0.25 mm. (Fig. 1). Just anterior to the base of the hooks there is an accessory sucker. The bothridia are fused to the head down to the level of the middle loculus.

Internal anatomy.—The testes first appear about six centimetres behind the scolex. When fully developed they number 120-150 and measure 120μ in diameter. They are situated in the dorsal part of the medulla between the right and left excretory canals. The cirrus sac extends slightly over one-fifth of the breadth of the segment and contains the coiled cirrus and the terminal coiled portion of the vas deferens. In immature segments the vas deferens is a narrow straight tube, but in mature segments it is wider and much coiled in the central part of the anterior half of the segment. The ovaries form a U-shaped mass with the lateral arms extending forward to the level of the cirrus sac and posteriorly meeting behind the shell gland. In transverse sections the ovaries consist of a horizontal layer with dorsal and ventral finger-like extensions. In mature segments the ovarian isthmus is swollen with ova and presses forward against the posterior wall of the uterus. The vagina, which opens to the genital pore just in front of the cirrus, runs back dorsally to the uterus, turns ventrally round the ovarian isthmus and meets the oviduct below the shell gland. From the gland, the uterine duct runs forward to open to the uterus about the level of the genital pore. The uterus is a large sacculated organ in the hindmost segments. There is no uterine pore but the musculature of the body wall is weakened at numerous points along the mid-ventral line. The vitelline glands are marginal in the medulla external to the excretory canals and extend from the level of the shell gland to the anterior end of the segment. The vitelline ducts unite before entering the shell gland. There is a pair of excretory canals on each side. Anteriorly they are approximately equal in diameter, but in the hinder part of the strobila the ventral canals enlarge and have a diameter of more than ten times that of the reduced dorsal canals. The nerve cord runs down at the lateral edge of the medulla. It passes dorsally to the cirrus and vagina.

The present species appears to be closely related to *Acanthobothrium cestraciontis*, Yamaguti (1934, Jap. Jour. Zool., vi., pt. 1). The presence of accessory suckers in *A. heterodonti* and their absence in *A. cestraciontis* is possibly of little significance, but the two species can be distinguished by the character of the hooks and by several features of the reproductive organs.

Platybothrium sp.

A single immature specimen of a *Platybothrium* was found in the spiral valve of *Mustelus antarcticus*. The scolex shows the flattening characteristic of the genus, but the hooks are distinctive in that, in each pair, both hooks are bifurcated. This feature is sufficient to distinguish the species from the two previously described species recorded by Southwell (1925), but it is considered inadvisable to describe a new species from such scanty material.

Order PSEUDOPHYLLIDEA.

Family DIPHYLLOBOTHRIIDAE.

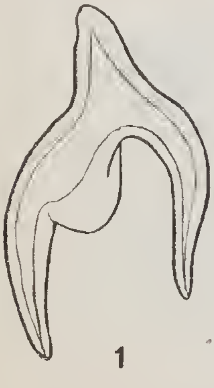
Diphyllobothrium arctocephali, n. sp.

(Plate XXIV., Figs. 4, 5.)

One mature specimen and a number of immature specimens were found in the caecum and colon of a seal, *Arctocephalus tasmanicus.*

The large specimen measured 23 cms. in length and attained a maximum width of 0.6 cm. The anterior segments are 3-4 mms. wide but extremely short, measuring only 0.03 mm. The segments gradually increase in length, and at the widest part of the strobila about 17 cms. behind the scolex, are 3 mms. long. Posteriorly to this region the segments become square and the terminal ones are longer than broad. They measure 6 mms. long by 3 mms. wide. The segments overlap slightly at the posterior margin.

The scolex is small, somewhat expanded towards the tip particularly in the dorso-ventral plane. In end view it is more or less rectangular, slightly longer dorso-ventrally than from side to side. The scolex has a length of 1.0 mm. and a maximum width of 0.9 mm. The bothridia which are on the dorsal and ventral surfaces extend forward to the apex of the head where they attain their maximum width of 0.8 mm. Posteriorly the two lips of a bothridium come together at a point half way down the scolex, and the sucker is continued as a narrow cleft to the base of the scolex. The lips are thin and are not folded (Fig. 2). The anterior border has a median notch and between the notches in the two bothridia the scolex forms a short conical rostellum.



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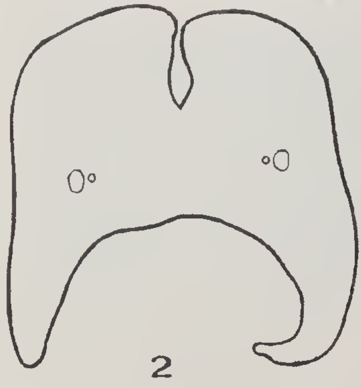

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Fig. 1.—Hook from bothridium of *Acanthobothrium heterodonti,* n. sp. (x. 75.)

Fig. 2.—Transverse section of the scolex of *Diphyllobothrium arctocephali,* n. sp. (x. 20.)

There is no neck; segmentation begins immediately behind the scolex.

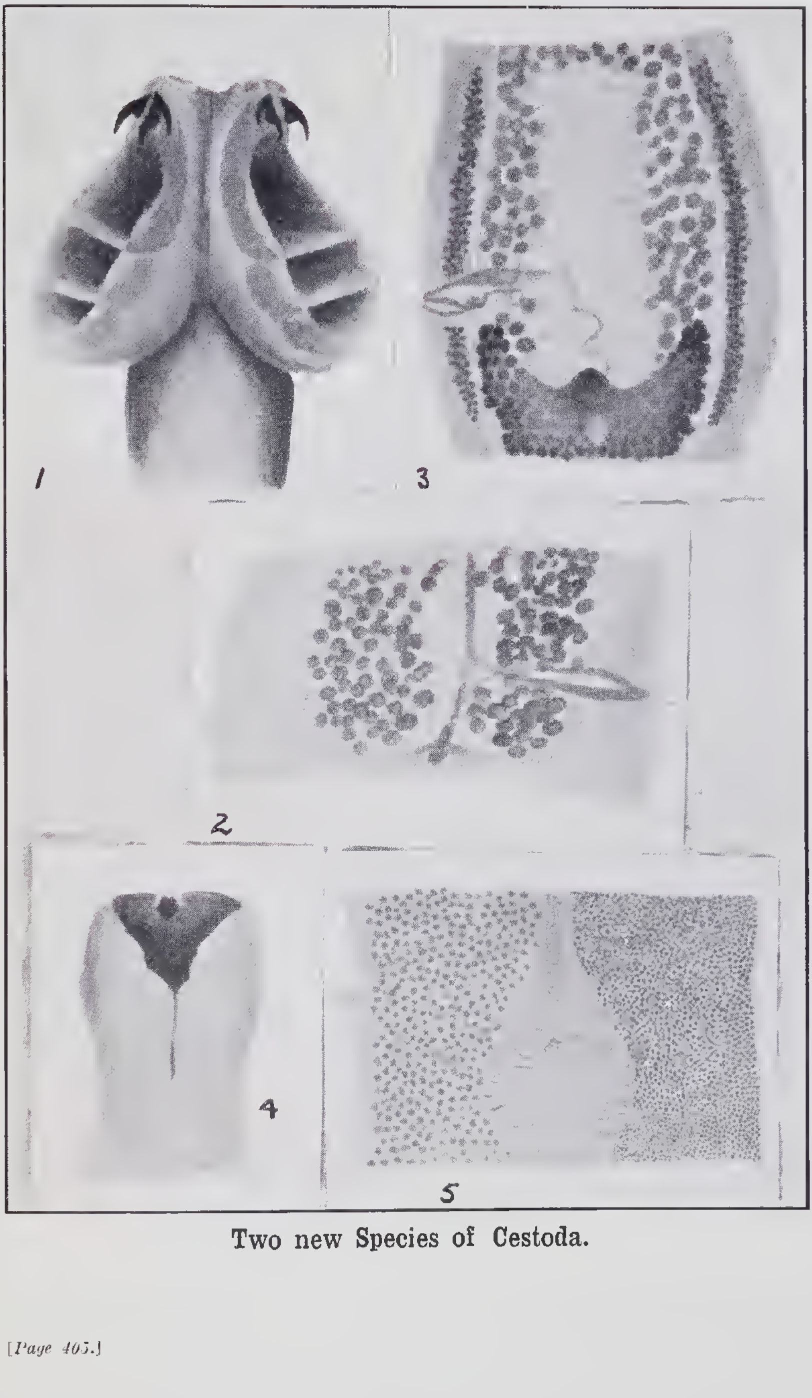
Rudiments of the genitalia appear about 6 mms. behind the scolex. The genital pore which has a diameter of 75μ is approximately half way along the segment and the uterine opening is a little distance further back. Both openings are situated in a median longitudinal groove continuous from segment to segment. Anterior to the genital pore the cuticle lining the groove shows a series of small puckerings. The testes are distributed over the full length of the segment in two lateral fields, separated posteriorly by the uterus, and anteriorly by a narrow area which is also devoid of vitelline gland follicles. In transverse sections 10-15 testes appear on each side. The uterus is a coiled tube with from 9-12 loops on each side. It forms a rosette shaped mass in the posterior half of the segment. The eggs are oval and operculated. They meaure 60μ x 35μ.

The longitudinal nerve cords are situated about one-quarter of the width of the segment from the margin. The excretory vessels are slightly more median. The muscular system is typical.

Explanation of Plate.

1. Scolex of *Acanthobothrium heterodonti*, n. sp. (× 24.)
2. Immature proglottis of *A. heterodonti*, n. sp. (× 40.)
3. Mature proglottis of *A. heterodonti*, n. sp. (× 24.)
4. Scolex of *Diphyllobothrium arctocephali*, n. sp. (× 20.)
5. Mature proglottid of *D. arctocephali*, n. sp. (× 12.)

The testes are shewn on the left hand and the vitellaria on the right.



Two new Species of Cestoda.

17. *Nemertini.*

By J. A. TUBB, B.Sc.

Family CEREBRATULIDAE.

LINEUS VITTATUS (Quoy and Gaimard, 1833).

Borlasia vittata Quoy and Gaimard, 1833, Voy. Astrolabe, iv., p. 287.

Lineus vittatus (Quoy and Gaimard), Bürger, 1904, Das Tierreich, xx., p. 94.

A specimen was taken in a rock pool on Square Reef, others being observed in the rock pools of Dinghy Cove.

LINEUS sp.

A small, probably regenerating, fragment of a form seen in the rock pools of Dinghy Cove has affinities with *Lineus anas* Joubert and Francois. The specimen (8 mm. long, 1 mm. in diameter) is black with twelve narrow white rings. The head clefts are bordered with white, but neither eyespots nor proboscis can be demonstrated.

18. *Crustacea.*

By J. A. TUBB.

Class CIRRIPEDIA.

Family CHTHALAMIDAE.

CATAPHRAGMUS POLYMERUS Darwin, 1853.

C. polymerus Darwin, 1853, Monograph of the Cirripedia, Balanidae, Ray. Soc. Publ. London, p. 487.

CHAMAESIPHO COLUMNA (Spengler, 1790).

Lepas columna Spengler, 1790, Skrifter Natur. hist., Selbskabet, i. Pl. vi.

C. columna Darwin, 1853, *l.c.*, p. 471.

Family BALANIDAE.

TETRACLITA PURPURASCENS (Wood, 1815).

Lepas purpurascens Wood, 1815, General Conchology, p. 58.

T. purpurascens Darwin, 1853, *l.c.*, p. 337.

These three species were extremely common along most of the coastline of the Island, particularly at West Cape, on the rocks of which barnacles (most commonly *T. purpurascens*) were found as high as 35 feet above water level, but were wetted by spray at high tide.

Class DECAPODA.

Family PALAEMONIDAE.

LEANDER SERENUS Heller, 1865.

L. serenus Heller, 1865, Reise der Novara, Crustacea, p. 110.

Fairly common in rock pools along the western coast.

Family SYNALPHEIDAE.

CRANGON SOCIALIS (Heller, 1865).

Alpheus socialis Heller, 1865, *loc. cit.*, p. 106.

C. socialis Hale, 1924, Crustacea of South Australia, p. 46.

Only one specimen was taken, but several of these forms were heard " snapping " in rock crevices in Dinghy Cove.

Family PALINURIDAE.

JASUS LALANDII (Lamarck).

Palinurus lalandii Lamarck, MS., in Museum, Jardin des Plantes.

J. lalandii Hale, 1929, *l.c.*, p. 65.

This species was commonly taken in 3-4 fathoms off Dinghy Cove.

Family PORCELLANIDAE.

PETROCHELES AUSTRALIENSIS Miers, 1876.

P. australiensis Miers, 1876, *Cat. Crust. N.Z.*, p. 91.

One specimen taken, and several observed among the rocks in Dinghy Cove.

Family LITHODIIDAE.

LOMIS HIRTA (Lamarck, 1816).

Porcellana hirta Lamarck, 1816, *l.c.*, p. 227.
L. hirta Milne-Edwards, 1837, Hist. Nat. Crust., ii., p. 188.

Extremely common along the whole western coast.

Family PORTUNIDAE.

NECTOCARCINUS TUBERCULOSUS Milne-Edwards, 1860.

N. tuberculosus Milne-Edwards, 1860, Ann. Sci. Nat., ser. 4, xiv., p. 220.

Fairly common along the western coast.

Family GRAPSIDAE.

CYCLOGRAPSUS AUDOUINII Milne-Edwards, 1837.

C. audouinii Milne-Edwards, 1837, *l.c.*, p. 78.

Very common in rock pools and between tide marks, seldom ascending more than a few yards above the wave-washed rocks. Specimens taken among weed were usually light fawn, tinged with orange, while those taken in bare pools or under basalt boulders were purple, mottled with light grey.

BRACHYNOTUS OCTODENTATUS (Milne-Edwards, 1832).

Cyclograpsus octodentatus Milne-Edwards, 1837, *l.c.*, p. 80.
B. octodentatus Hale, 1929, *l.c.*, p. 182.

Most common on western and southern coasts, ascending almost to the cliff top above McCoy Platform and the Drip. Commonly found in the fresh-water pools and tunnels of the springs on West Cape.

PLAGUSIA CHABRUS (Linnaeus, 1766).

Cancer chabrus Linnaeus, 1766, Syst. Nat., ed. 10, p. 1044.
P. chabrus White, 1846, Ann. Mag. Nat. Hist., xvii., p. 497.

Very common in the rock pools around the island, but not found above water level. Apparently largely vegetarian in diet, many cases were noted in which these crabs were seen to pluck and eat the filamentous green Algae. *P. chabrus* is a strong swimmer, swimming sideways by means of rapid strokes of the distal and penultimate joints of the legs, the legs all moving in unison.

Class ISOPODA.

Family GNATHIDAE.

Segmented and Praniza larvae were found attached to the fins and opercula of two specimens of *Bovichtus variegatus* (Rich.), which were found in a pool on Square Reef.

Family ANTHURIDAE.

MESANTHURA MACULATA (Haswell, 1881).

Haliophasma maculata Haswell, 1881, Proc. Linn. Soc. N.S.W., v., p. 477.
Mesanthura maculata Hale, 1929, *l.c.*, p. 245.

One specimen was found on weed dredged in 3 fathoms at Dinghy Cove.

Family SPHAEROMIDAE.

AMPHOROIDEA ELEGANS Baker, 1911.

Amphoroidea elegans Baker, 1911, Trans. Roy. Soc. S.A., xxv., p. 89.

EXOSPHAEROMA LAEVIS (Haswell, 1881).

Sphaeroma laevis Haswell, 1881, *l.c.*, p. 472.
Exosphaeroma laevis Hale, 1929, *l.c.*, p. 276.

EXOSPHAEROMA sp.

CYMODOCEA ACULEATA Haswell, 1881.

Cymodocea aculeata Haswell, 1881, *l.c.*, p. 474.

Family IDOTEIDAE.

EUIDOTEA BAKERI (Collinge, 1917).

Paridotea bakeri Collinge, 1917, J. Zool. Research, p. 112.
Euidotea bakeri Hale, 1929, *l.c.*, p. 317.

PARIDOTEA MUNDA Hale, 1929.

Paridotea munda Hale, 1929, *l.c.*, p. 319.

Family LIGIIDAE.

LIGIA AUSTRALIS Dana, 1853.

Ligia australis Dana, 1853, U.S. Explor. Exped., Crust., ii., p. 740.

Family ARMADILLIDAE.

ARMADILLO (BUDDELUNDIA) ALBOMACULATUS Budde-Lunde, 1912.

Armadillo (*Buddelundia*) *albomaculatus* Budde-Lunde, 1912, Oniscoidea in; Michaelsen and Hartmeyer, Die Fauna Sud-west Australiens, iv., p. 33.

Indeterminate specimens of two species of Janiridae and one species each of *Oniscus* and Stenetridae were also collected.

Class AMPHIPODA.

Except where otherwise stated, these species were obtained from rock pools and weed on the north coast of West Cape and in Dinghy Cove.

I am indebted to Mr. K. Sheard, of the Museum of South Australia, for his kindness in checking the identification of these specimens.

Family LYSIANASSIDAE.

AMARYLLIS MACROPHTHALMA (Haswell, 1880).

Amaryllis macrophthalma Haswell, 1880, Proc. Linn. Soc. N.S.W., vi., p. 253, pl. viii., fig. 3.

Family LEUCOTHOIDAE.

LEUCOTHOE SPINICARPA (Abildgaard, 1789).

Gammarus spinicarpa Abildgaard, 1789, in; Muller, Zool. Dan., ed. 3, iii., p. 66, pl. cxix., figs. 1-4.
Leucothoe spinicarpa G. O. Sars, 1892, Crust. Norway, i., p. 283, pl. c.

Family GAMMARIDAE.

ELASMOPUS SUBCARINATUS (Haswell, 1879).

Megamoera subcarinata Haswell, 1879, Proc. Linn. Soc. N.S.W., iv., p. 335.
Elasmopus subcarinatus Stebbing, 1906, Das Tierreich, xxi., p. 441.

CERADOCUS RUBROMACULATUS (Stimpson, 1855).

Gammarus rubromaculatus Stimpson, 1855, Proc. Philad. Acad. Nat. Sci., vii., p. 394.
Ceradocus rubromaculatus Stebbing, 1906, *l.c.*, p. 430.

MAERA MASTERSII (Haswell, 1879).

Megamoera mastersii Haswell, 1879, *l.c.*, p. 265, pl. xxii., fig. 1.
Maera mastersii Stebbing, 1906, *l.c.*, p. 439.

PHERUSA sp.

Family DEXAMINIDAE.

PARADEXAMINE PACIFICA (Thomson, 1879).

Dexamine pacifica Thomson, 1879, Trans. N.Z. Inst., xi., p. 238.
Paradexamine pacifica Stebbing, 1906, *l.c.*, p. 363.

Family PONTOGENEIDAE,

PARAMOERA AUSTRINA (Bate, 1862).

Atylus austrina Bate, 1862, Cat. Amphipoda Brit. Mus., p. 137.
Paramoera austrina Stebbing, 1906, *l.c.*, p. 363.

Family TALITRIDAE.

HYALE GRANDICORNIS (Kroyer, 1845).

Orchestia grandicornis Kroyer, 1845, Natur. Tidsskr., ser. 2, i., p. 292.
Hyale grandicornis Stebbing, 1906, *l.c.*, p. 566.

TALORCHESTIA DIEMENENSIS (Haswell, 1879).

Talorchestia diemenensis Haswell, 1879, *l.c.*, p. 248.

This form was taken in brakish pools on McCoy Platform at about 25 feet above sea level.

PARORCHESTIA TENUIS (Dana, 1852).

Orchestia tenuis Dana, 1852, Proc. American Acad. arts sci., ii., p. 202.
Parorchestia tenuis Stebbing, 1906, *l.c.*, p. 557.

This form was found amongst moss and grass at the Drip, 90 feet above sea level.

Family AMPHITHOIDAE.

(?) AMPHITHOE FLINDERSI (Stebbing, 1888).

Amphithoe flindersi Stebbing, 1888, *l.c.*, p. 1120.

Family AORIDAE.

LEMBOS PHILACANTHUS (Stebbing, 1888).

Autonoe philacantha Stebbing, 1888, *l.c.*, p. 1082.
Lembos philacanthus Stebbing, 1906, *l.c.*, p. 598.

Family PODOCERIDAE.

ICILIUS OVALIS Dana, 1852.

Icilius ovalis Dana, 1852, *l.c.*, p. 220.

DULICHIA sp.

Family CAPRELLIDAE.

LIRIARCHUS PERPLEXUS Mayer, 1912.

Liriarchus perplexus Mayer, 1912, in Michaelsen and Hartmeyer—Die Fauna S.-W. Aust., iv. (1), p. 6.

19. *Arachnida.*

By J. A. TUBB.

Class PYCNOGONIDA.

Family AMMOTHEIDAE.

LECYTHORYNCHUS sp.

A juvenile specimen from a rock pool on the western coast of the Island. The ovigerous legs consist of two segments.

Family PALLENIDAE.

PALLENE LAEVIS Hoek, 1881.

Pallene laevis Hoek, 1881, Rep. Voy. Challenger, iii., p. 78, Pl. XI., figs. 8-12.

A large male, bearing two egg-masses, was dredged off West Cape, in 25 fathoms.

Family PHOXICHILIIDAE.

PHOXICHILIDIUM VIRESCENS Hodge, 1864.

Phoxichilidium virescens Hodge, 1864. Ann. Mag. Nat. Hist., ser. 3, xiii., p. 115. Pl. XIII., figs. 13-15.

One male from a rock pool on the western coast. The chelate mandibles are finely pointed and slightly incurved, their bases contiguous and slightly anterior to the oculiferous tubercle.

Class CHELONITHIDA.

Five species of Chelonithida were collected. Three appear to be new, and the range of two others is extended.

Family OLPIIDAE.

SOLINUS AUSTRALIENSIS Chamberlain, 1930.

Solinus australiensis Chamberlain, 1930, Ann. Mag. Nat. Hist., ser. 10, V., p. 597.

One specimen found beneath a basalt boulder near Seal Bay. Previously recorded from Barringum, N.S.W.

Family GARYPIDAE.

SYNSPHYRONUS PARADOXUS Chamberlain, 1930.

Synsphyronus paradoxus Chamberlain, 1930, *loc. cit.*, p. 617.

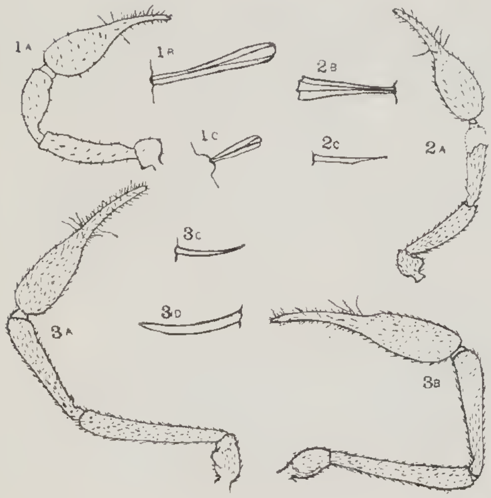
This is the species most commonly found on the Island. Many specimens were taken, and, towards the end of January, a female, with a number of white juveniles was found beneath a flat stone, in a pocket composed of silk and earth.

Genus **Maorigarypus.** Chamberlain, 1930.

MAORIGARYPUS VIRIDIS, sp. nov.

(Figs. 1, *a-c.*)

Female.—Light green, with black markings on the carapace and abdomen. Carapace typically garypoid, broader than long, anterior border emarginate, transverse furrows not observable.



FIGS. 1–3.

FIG. 1.—*Maorigarypus viridis* ♀. *a.* Left palp. × 15. *b.* Seta of tergite. × 325. *c.* Seta of palp. × 325. Fig. 2.—*Ideochelifer brevidigitatus* ♂. *a.* Right palp. × 15. *b.* Seta of tergite. × 325. *c.* Seta of palp. × 325. Fig. 3.—*I. australis.* *a.* Left palp of ♀. × 15. *b.* Right palp of ♂ × 15. *c.* Seta of tergite of ♂ × 325. *d.* Seta of palp of ♂. × 325.

Eyes distinctly on anterior half of carapace.

Tergites I. and XI. entire, tergites II.-X. with median suture.

Surface finely shagreened, each tergite with 4 black spots, the posterior edge of each tergite with a deeper green band.

Tergites I.-VII. each with 4 setae, VIII.-X. each with 8 setae, XI. with 4 setae; all these setae are clavate.

Chelicerae typically garypoid, galea with two terminal branches, flagellum of three stout setae, the largest of which carries two lateral spines.

Palps stout, clothed with clavate setae. Trochanter rectangular, slightly longer than broad, one rounded prominence posteriorly. Femur pedicellate, as long as thorax, anterior face almost straight, posterior face convex. Tibia 2.2 times as long as broad, with a strongly bent pedicel. Chela pedicellate, pedicel constricted near hand, hand bilaterally swollen, broader than deep, fixed finger with 9 tactile setae, movable finger with one, vestitural setae clavate on hand, acute on fingers.

Fingers 1.2 times as long as hand, slightly curved. Total length.—2.8 mm. A single specimen found beneath a flat stone near Seal Bay.

Family CHELIFERIDAE.

Genus **Ideochelifer.** Chamberlain, 1932.

Ideochelifer brevidigitatus, sp. nov.

(Figs. 2, *a-c.*)

Male.—Dark brown, carapace longer than broad, truncate anteriorly, transverse furrows distinct, posterior furrow closer to hind edge of carapace than to anterior furrow.

Tergites all with median clefts, surface of tergites and carapace granulate, posterior edge of tergites entire except for median cleft.

Chaetotaxy of tergites.—I., 16; II., 16; III., 16; IV., 18; V., 18; VI., 20; VII., 20; VIII., 20; IX., 16; X., 16; XI., 12. All these setae are broadened and denticulate at the tip.

Chelicerae project in front of the carapace, galea foliate at the tip, flagellum of three stout setae, the largest denticulate.

Palps stout, vestitural setae curved and acute. Trochanter pedicellate, broadly ovate. Femur stout, subpedicellate, 1.3 times as long as carapace, slightly longer than tibia. Tibia stout, pedicellate, 3 times as long as broad. Chela pedicellate, pedicel constricted near hand, hand swollen, little broader than deep, fingers sub-equal to hand.

Coxae IV. with coxal glands. Tarsi of fourth legs with simple subterminal setae, tarsi I. without terminal projections, all claws simple.

Total length.—2.7 mm.

One male found under a basalt boulder.

Ideochelifer australis, sp. nov.

(Figs. 3, *a-d.*)

Female.—Body dark brown, legs and palps paler. Carapace longer than broad, transverse furrows distinct, distance between anterior furrow and posterior twice that between the posterior furrow and the hind edge of the carapace. Surface of carapace and tergites finely granulated.

Tergites all with median clefts, that of tergite II. very indistinct, posterior edges of tergites entire except for median cleft, posterolateral angles of tergites II. and III. are produced.

Chaetotaxy of tergites.—I., 12; II., 22; III., 22, IV., 22; V., 26; VI., 26; VII., 24; VIII., 24; IX., 24; X., 18; XI., 18.

Setae of tergites I.-X. are broadened and denticulate at the tip, setae of tergite XI. are curved and acute.

Chelicerae project in front of the carapace, galea foliate at the tip, flagellum of three stout setae, the largest denticulate.

Palps slender, vestitural setae curved and acute. Trochanter elongate oval, with a large rounded protuberance dorsally. Femur 1.2 times as long as the carapace, 1.1 times as long as the tibia. Tibia slender, 4.8 times as long as broad. Chela pedicellate, slender, 1.5 times as long as tibia, fingers 1.3 times as long as hand.

Tarsi IV. with simple subterminal setae, tarsi I. without terminal projections, all claws simple.

Total length—3.8 mm.

Male—Body almost black, legs and palps light brown.

Tarsi IV. with coxal glands. Otherwise similar to female.

Three adult and two immature specimens found near Seal Bay. This, like the foregoing species, is a rock dwelling form.

Types in the National Museum, Melbourne.

Class ACARI.

Parasitic acari occurred in very large numbers, but the Trombidoid mites, which formed a notable proportion of the rock frequenting arthropods, were more sporadic in occurrence.

Family ARGASIDAE.

Ornithodorus talaje var. capensis Neumann, 1901.

Ornithodorus talaje var. *capensis* Neumann, 1901, Mem. Soc. Zool. de France, XIV., p. 258.

Adults, nymphs and larvae were found in large numbers in the nests of the Little Penguin (*Eudyptula minor*).

Towards the middle of February, the viviparity of the species was demonstrated. Gravid females were seen on the shaded face of a basalt boulder, about 30 feet from the nearest penguin nest, and the emergence of the larvae was observed.

Larva :—

Body—length, 0.35 mm.; breadth, 0.26 mm.; broadly oval in contour, pale yellow, with numerous long setae (0.1 mm.) integument finely striated.

Capitulum—inserted ventrally, basis capituli hidden, palps and hypostome projecting in front. Palps slender, sub-equal to hypostome, furnished with a few setae, inner and terminal setae very short. Hypostome 0.16 mm. long.

Legs—robust, as long as the body, coxae contiguous, tarsi tapering abruptly, pedicel as long as the claws, pulvillus $\frac{1}{3}$ as long as the claws.

This variety of *O. talaje* has previously been recorded from Cape Colony only.

Family IXODIDAE.

Ixodes percavatus Neumann, 1906.

Ixodes percavatus Neumann, 1906. Arch. Parasit. Paris, x., p. 200, figs. 4, 5.

Even more common than the previous species, in the nests of *Eudyptula minor.*

Male:—

Body—length, 3.4 mm,; breadth, 2.4 mm.; broadly oval, widest near the middle, tapering slightly anteriorly.

Scutum—polished, minutely punctate, dark reddish brown, a median prominence above the insertion of the basis capituli, marginal fold with numerous short setae.

Venter—anal grooves not closed behind, slightly convergent, terminating on the marginal fold. Genital aperture between coxae II. and III., spiracle almost circular, aperture eccentric.

Capitulum—slightly longer than broad, broadest at insertion of the palps, with a distinct posterior dorsal ridge. Basis capituli rectangular, palps slightly longer than hypostome, junction of articles II. and III. indistinct.

Legs—medium length, robust, furnished with stout setae, coxae and trochanters without processes, all tarsi distinctly humped, tarsus I. with a pit proximal to the terminal protuberance.

Female:—

Newly emerged—length, 2.7 mm.; breadth, 2.2 mm.

Engorged—length, 7.5 mm.; breadth, 6.2 mm.

Nymph (engorged):—

Body—length, 3.4 mm.; breadth, 2.4 mm. Scutum—relatively wider than in female. Capitulum—similar to female. Legs—relatively more robust than in female.

Larva (newly emerged):—

Body—length, 0.46 mm.; breadth, 0.43 mm. Scutum—broad, smoothly rounded, narrower posteriorly. Capitulum—cornua only slightly produced, palps and hypostome similar to female.

Legs—long, moderately robust, coxae and trochanters without spurs, tarsus I. with two tubercules and an intermediate depression, tarsi II. and III. indistinctly humped.

Egg—length, 0.34 mm.; breadth, 0.27 mm.

Found in the nests of *Eudyptula minor,* and later in a few burrows of the muttonbird (*Puffinus tenuirostris*), but only where the penguin nesting ground overlapped that of the muttonbird.

Most penguin nests contained large numbers of parasites. One nest, which may be regarded as typical, yielded over 200 specimens of *I. percavatus* and *O. talaje* var. *capensis,* in various stages of development.

Infestation of the hosts did not appear to be very heavy. Young and moulting penguins often carried several adult ticks and a few nymphs and larvae, but fully fledged birds were not observed to harbour adult parasites, the infestation being confined to nymphs and larvae.

Family HALARACHNIDAE.

Genus **Halarachne** Kramer, 1885.

HALARACHNE REFLEXA, sp. nov.

Female :—

Body—length, 5.8 mm.; breadth, 0.8 mm.; broadest at the middle of the scutum, "abdomen" more or less cylindrical.

Scutum :—elongate, narrowing abruptly in front, truncate posteriorly, surface finely shagreened, a median opaque area with paired lateral extensions between which are numerous more transparent spots on a brown background. Three pairs of setae occur on the scutum.

Venter—ventral plate ovoid, small, surface finely shagreened, three pairs of fine setae present. Vulva opens as a wide transverse slit just behind coxa IV. Spiracles comma-shaped, between legs III. and IV.

Anus—terminal, with three setae on a feebly chitinized ventral plate.

Capitulum—palps short and stout, article III. 1.5 times as long as article II., article II. subequal to article I. Vestitural setae fine, acute. Subterminal setae stout, forming a group of two or three. Chelicerae strong, retractile, basal segment broad, finger broadened at the tip, tip irregularly toothed.

Legs—short and stout, legs II. and III. more robust than legs I. and IV. Tarsi II. and III. narrowing abruptly to the claws; claws strong, pulvilli short. The chaetotaxy of the legs shows much individual variation.

Male :—

Body—length, 3.6 mm.; breadth, 0.7 mm.

Chelicerae—stout, retractile, curved and tapering, tip slightly recurved, rather blunt.

Genital aperture—between coxae IV.

In all other external features closely resembling the female.

This species is separable from *H. otariae* Steding by the shape of the scutum and the chelicerae.

The mites were found in the posterior nasal passages of the Tasmanian Sea Bear (*Arctocephalus tasmanicus* Lord and Scott). The infestations were very heavy in all the hosts examined.

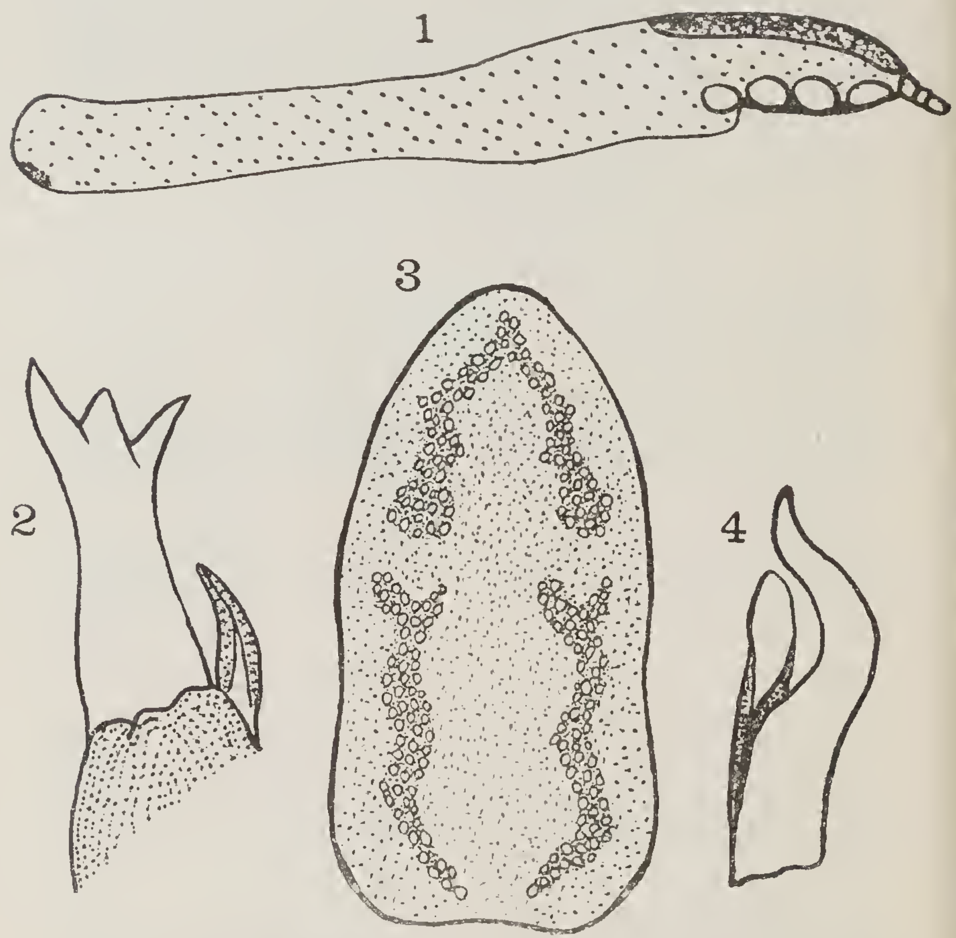


Fig. 1.—*Halarachne reflexa,* n. sp. 1. Lateral view, × 12. 2. Chelicera of female, × 220. 3. Scutum, × 40. 4. Chelicera of male, × 220.

The cephalothorax and legs of the parasite were buried in the mucous membrane, the long white "abdomen" protruding into the lumen of the nasal passage. The locus of infection was inflamed and swollen, and it was found impossible to dislodge the mites without causing extensive damage to the mucous membrane of the host.

Types in the National Museum, Melbourne.

Family DERMANYSSIDAE.

DERMANYSSUS sp.

Large numbers of these parasites were found in the nests of the muttonbird (*Puffinus tenuirostris*).

Family ERYTHRAEIDAE.

ERYTHRAEUS REGINA (Hirst, 1928).

Leptus regina Hirst, 1928. Ann. Mag. Nat. Hist., ser. 10, i., p. 569.
Erythraeus regina Womersley, 1934. Rec. S. Aust. Mus., v., p. 219.

With the exception of the parasitic forms, this is the most common mite on the Island. Almost every large stone, particularly near Seal Bay, yielded a large number of these acarines, adult nymphs and "pupae."

LEPTUS ORNATUS Womersley, 1934.

Leptus ornatus Womersley, 1934, *loc. cit.*, p. 224.

This extremely beautiful species was found on the flowers and leaves of *Enchylaena tomentosa*, and its brilliant iridescence rendered it most conspicuous.

Family TROMBIDIIDAE.

MICROTROMBIDIUM KARRIENSIS Womersley, 1934.

Microtrombidium karriensis Womersley, 1934, *loc. cit.*, p. 191.

CAENOTHROMBIUM NYNGANENSE (Hirst, 1928).

Dinothrombium nynganense Hirst, 1928, *loc. cit.*, p. 556.
Caenothrombium nynganense Womersley, 1934, *loc. cit.*, p. 205.

CAENOTHROMBIUM MINIATUM Womersley, 1934.

Caenothrombium miniatum Womersley, 1934, *loc. cit.*, p. 206.

CAENOTHROMBIUM CRASSUM (Hirst, 1928).

Dinothrombium crassum Hirst, 1928, *loc. cit.*, p. 567.
Caenothrombium crassum Womersley, 1934, *loc. cit.*, p. 203.

These trombid mites were usually found in company with *Erythraeus regina*, but none of the species was common.

Family BDELLIDAE.

BISCURUS INTERMEDIUS Thor, 1928.

Biscurus (Biscurus) intermedius (Thor, 1928) Womersley, 1933. Trans. Roy. Soc. S. Aust., lvii., p. 104.

Two specimens of this active red mite were found on the cliffs above McCoy Platform.

20. *Tunicata, Ascidiacea.*

By J. A. TUBB.

Family PYURIDAE.

Pyura australis (Quoy and Gaimard, 1834).

Ascidia australis Quoy and Gaimard, 1834, Voy. Astrolabe, Zool., iii., p. 614.

P. australis Michaelsen, 1930, Die Fauna Sudwest-Australiens, v., p. 413.

One small specimen dredged in 25 fathoms off West Cape.

Pyura sp.

A single specimen related to *P. gibbosa* Heller, but differing in having foliate anal lobes, was found attached to the holdfast of Kelp.

Family RHODOSOMATIDAE.

Corella japonica Herdman, 1880.

C. japonica Herdman, 1880, Proc. Roy. Soc. Edinburgh, p. 472.

One small specimen found. This is a new record for Australian seas.

? Corella eumyota Traustedt, 1881.

C. eumyota Traustedt, 1881, Vid. Medd. Nat. For. Kobenhavn, p. 273.

One juvenile specimen taken.

Family STYELIDAE.

Sub-family BOTRYLLINAE.

Botrylloides leachi (Savigny, 1816).

For Synonymy see Michaelsen 1930; *loc. cit.*, p. 341.

Two small colonies found.

Family CLAVELINIDAE.

Sub-family POLYCITORINAE.

Polycitor circes Michaelsen, 1930.

P. circes Michaelsen, 1930, *loc. cit.*, p. 495.

Several colonies of *P. circes* Mch. were found exposed at low tide, and, although protected by overhanging rock ledges, were dry on the surface. In most cases they were uncovered for about two hours at each low tide. When the colonies were removed and placed in sea-water, the zooids rapidly expanded.

Cystodites dellechiaje f. durus von Drasche, 1883.

For Synonymy see Michaelsen 1930, *loc. cit.*, p. 501.

One small colony found at Seal Bay.

Distaplia murrayi (Herdman, 1886).

Colella murrayi Herdman, 1886. Rep. Voy. Challenger, xiv., p. 115.

One colony from 25 fathoms off West Cape.

Distaplia sp.

A small colony of only three zooids, much contracted, found in a rock pool on Square Reef.

Family SYNOICIDAE.

Amaroucium albidum Herdman, 1886.

A. albidum Herdman, 1886, *loc. cit.*, p. 234.

Amaroucium exile Van Name, 1902.

A. exile Van Name, 1902, Trans. Conn. Acad. Sci., xi., p. 354.

The colonies referred to this species differ from the typical form in having slightly smaller zooids, 2.0–2.5 mm. long exclusive of the postabdomen, and the anal tongue is bilobed.

Amaroucium variabile Herdman, 1886.

A. variabile Herdman, 1886, *loc. cit.*, p. 216.

Amaroucium globosum Herdman, 1886.

A. globosum Herdman, 1886, *loc. cit.*, p. 219.

Amaroucium constrictum Sluiter, 1900.

A. constrictum Sluiter, 1900, Zool. Jahrb. Syst., xiii., p. 17.

Aplidium fallax Johnston, 1834.

A. fallax Johnston, 1834, Mag. Nat. Hist., ser. 1, vii., p. 15.

Aplidium sp.

Psammaplidium incrustans Herdman, 1899.

Ps. incrustans Herdman, 1899, Tunicata, Aust. Mus. Cat., 17, p. 87.

Family DIDEMNIDAE.

Didemnum tonga (Herdman, 1886).

Leptoclinum tonga Herdman, 1886, *loc. cit.*, p. 267.

D. tonga Hartmeyer, 1909, Bronn's Kl. und. Ord. des Thierreichs, iii., Suppl. Ib., p. 1451.

21. *Pisces.*

By J. A. TUBB.

Family HETERODONTIDAE.

HETERODONTUS PHILIPPI (Bloch and Schneider, 1801).

Squalus philippi Bloch and Schneider, 1801, Syst. Ichth., p. 134.
Heterodontus philippi McCoy, 1886, Prod. Zool. Vict., dec. xii., pl. 113.

Family GALEIDAE.

MUSTELUS ANTARCTICUS Gunther, 1870.

Mustelus antarcticus Gunther, 1870, Brit. Mus. Cat. Fish, viii., p. 387.

Family LAMNIDAE.

CARCHARODON CARCHARIAS (Linnaeus, 1758).

Squalus carcharias Linnaeus, 1758, Syst. Nat., ed. 10, p. 235.
Carcharadon carcharias Garman, 1913, Mem. Mus. Comp. Zool., xxxvi., p. 32, pl. v., figs. 5-9.

Family MYLIOBATIDAE.

MYLIOBATIS AUSTRALIS McLeay, 1881.

Myliobatis australis McLeay, 1881, Proc. Linn. Soc. N.S.W., vi., p. 380.

Family ZEIDAE.

CYTTUS AUSTRALIS (Richardson, 1849).

Capros australis Richardson, 1849, Trans. Zool. Soc., iii., p. 72.
Cyttus australis McCulloch, 1927, Fishes of N.S.W., p. 34.

Family NOMEIDAE.

SERIOLELLA BRAMA (Gunther, 1860).

Neptonemus brama Gunther, 1860, Brit. Mus. Cat. Fish, ii., p. 390.
Seriolella brama McCulloch, 1911, Sci. Repts. Endeavour Exped., p. 34.

Family HYPOPLECTRODIDAE.

CAESIOPERCA RASOR (Richardson, 1839).

Serranus rasor Richardson, 1839, Proc. Zool. Soc., p. 95.
Caesioperca rasor McCulloch, 1929-30, Mem. Aust. Mus., v., p. 155.

Family SCORPIDAE.

SCORPIS GEORGIANUS Cuvier and Valenciennes, 1831.

Scorpis georgianus Cuvier and Valenciennes, 1831, Hist. Nat. Poiss., viii., p. 503.

Family CHIRONEMIDAE.

CHIRONEMUS MARMORATUS Gunther, 1860.

Chironemus marmoratus Gunther, 1860, *loc. cit.*, p. 26.

Family CORIDAE.

PSEUDOLABRUS TETRICUS (Richardson, 1840).

Labrus tetricus Richardson, 1840, Proc. Zool. Soc., p. 25.

Pseudolabrus tetricus McCulloch, 1913, Rec. Aust. Mus., ix., p. 377, pl. xix.

PSEUDOLABRUS FUCICOLA (Richardson, 1840).

Labrus fucicola Richardson, 1840, *loc. cit.*, p. 26.

Pseudolabrus fucicola McCulloch, 1929-30, *loc. cit.*, p. 309.

PSEUDOLABRUS MILES (Bloch and Schneider, 1801).

Labrus miles Bloch and Schneider, 1801, *loc. cit.*, p. 264.

Pseudolabrus miles McCulloch, 1929-30, *loc. cit.*, p. 309.

Family BOVICHTIDAE.

BOVICHTUS VARIEGATUS (Richardson, 1846).

Bovichthys variegatus Richardson, 1846, Zool. Voy. Erebus and Terror, Fish., p. 56.

Bovichtus variegatus McCulloch, 1927, *loc. cit.*, p. 77.

Family ACINACIDAE.

THYRSITES ATUN (Euphrasen, 1791).

Scomber atun Euphrasen, 1791, Stockh. Vet. Akad. Nya. Hand., xii., p. 315.

Thyrsites atun McCulloch, 1921, Rec. Aust. Mus., xiii., p. 139.

Family BLENNIIDAE.

BLENNIUS TASMANIANUS Richardson, 1839.

Blennius tasmanianus Richardson, 1839, *loc. cit.*, p. 99.

CLINUS PERSPICILLATUS Cuvier and Valenciennes, 1836.

Clinus perspicillatus Cuvier and Valenciennes, 1836, Hist. Nat. Poiss., xi., p. 372.

Family PLATYCEPHALIDAE.

PLATYCEPHALUS BASSENSIS Cuvier and Valenciennes, 1829.

Platycephalus bassensis Cuvier and Valenciennes, 1829, Hist. Nat. Poiss., iv., p. 247.

Family GOBIESOCIDAE.

DIPLOCREPIS CARDINALIS (Ramsay, 1882).

Gobiesox cardinalis Ramsay, 1882, Proc. Linn. Soc. N.S.W., vii., p. 148.

Diplocrepis cardinalis Waite, 1905, Rec. Aust. Mus., vi., p. 204.

Family ALETERIDAE.

CANTHERINES AYRAUDI (Quoy and Gaimard, 1824).

Balistes ayraudi Quoy and Gaimard, 1824, Voy. Uranie Physic., Zool., p. 216, pl. xlvii., fig. 2.

Cantherines ayraudi McCulloch, 1927, *loc. cit.*, p. 99.

CANTHERINES GUNTHERI (McLeay, 1881).

Monacanthus guntheri McLeay, 1881, *loc. cit.*, p. 314.
Cantherines guntheri McCulloch, 1927, *loc. cit.*, p. 100.

Family CHEILODACTYLIDAE.

PSILOCRANIUM NIGRICANS (Richardson, 1850).

Cheilodactylus nigricans Richardson, 1850, Proc. Zool. Soc., xviii., p. 26.
Psilocranium nigricans McCulloch, 1929-30, *loc. cit.*, p. 259.

Discounting the rock pool forms, the preceding list is made up of fish caught on hand lines, or observed. No equipment was taken with which an intensive survey of the fish fauna could be carried out, so that this report must necessarily be very incomplete.

Apart from the poorer types of fish, such as Kelpfish and Parrotfish, which were present in enormous numbers, many first class food fish were freely caught, particularly over the reef which extends eastward from Cape Frederic. *Seriolella brama* and *Scorpis georgianus*, known locally as "Haddock" and "Sweep" respectively, were both common, and *Platycephalus bassensis* was taken from sandy areas off Dinghy Cove.

Diplocrepis cardinalis is a new record for Victorian waters.

The nomenclature adopted in this report is that used in McCulloch's Checklist of Fishes of Australia, Mem. Aust. Mus., v., 1929-30.

22. *Reptilia.*

By J. A. TUBB.

Family SCINCIDAE.

Egernia whitii (Lacépède, 1804).

Scincus whitii Lacépède, 1804, Ann. Mus. Nat. Paris, iv., p. 192.
Egernia whitii Boulenger, 1887, Brit. Mus. Cat. Lizards, iii., p. 135.

This species occurs in the following three distinct colour variations, peculiarly restricted in their distribution.

Form A.—Generally dark brown dorsally, scales olive brown with sparse black and white spots; head brown; eyelids edged with yellow. Restricted to a small area surrounding the Drip.

Form B.—Dark grey dorsally, with a median orange stripe and two lateral white stripes, sides mottled black, white and grey; head grey; scales and eyelids edged with white. Restricted to the talus slopes of Dinghy Cove.

Form C.—Similar to Form B, but with a white median stripe. Occurs all over the island.

23. *Aves.*

By FREDERIC WOOD JONES and J. A. TUBB.

(A) Native species nesting on the Island.

The nomenclature followed is that given in the Official Check List, R.A.O.U., Ed. 2, 1926.

Family SPHENISCIDAE.

EUDYPTULA MINOR (Forster, 1781).

Aptenodytes minor Forster, 1781, Comm. Gott., iii., p. 147.

The little Blue Penguins had their main breeding area on the western corner of the island, the birds reaching this area on the plateau by two well defined tracks, one ascending the talus slope at the head of Seal Bay, the other running over McCoy Platform and thence up the cliff to West Cape. Breeding birds were also nesting under the boulders of the talus slopes at Dinghy Cove, Seal Bay and McCoy Platform.

The birds assemble in Seal Bay at about sunset and all come ashore in a concerted rush. Scrambling on to the rocks at the water's edge, some time is spent shaking off the water and preening before commencing the laborious climb to the plateau. The ascent of the talus slope takes about an hour, and, by the time the first birds have reached the plateau, there is a continuous line of penguins, often four or five abreast, extending from the surf to the cliff top. Having attained the plateau, many birds still have a journey of half a mile before reaching their nesting burrows. At daybreak the parent birds start to descend the cliffs and remain at sea all day.

When the party first landed on the island the burrows contained fresh eggs or downy chicks and, by the end of the visit, almost all the young birds had taken to the water. The downy chicks leave their burrows at night and wander about whilst awaiting their parents, but they return to their burrows during the day.

After the chicks are ready to shift for themselves, the parent birds remain ashore for about a month while moulting. During the whole of this period they do not appear to feed, but they may be seen occasionally preening at the water's edge. During the moult, practically all the old plumage is shed at one time, and the moulting birds are much restricted in their activities and retiring in their habits.

Family PROCELLARIIDAE.

PUFFINUS TENUIROSTRIS (Temminck, 1835).

Procellaria tenuirostris Temminck, 1835, Pl. Col., livr. 99, pl. 587.

The Bass Strait Mutton Bird occupies two large rookeries on the island (see map), the northern breeding area being the largest. The birds come in on their homing flight at about sunset.

Large flocks were often seen feeding close to the island during the late afternoon. Eggs, both fresh and in an advanced stage of incubation, were found on our arrival at the island. The first downy chick was seen on January 15th and hatching continued until February 10th, by which time the more advanced chicks were showing signs of developing quill feathers. The burrows are often 3–4 feet in length and the nesting chambers, seldom more than a few inches below the surface, usually contain some dried twigs with an occasional admixture of feathers. The birds, even the downy chicks, are extremely pugnacious. Many eggs were found lying on the surface of the ground in the neighbourhood of the nesting burrows. No explanation of this state of affairs was discovered.

Pachyptila turtur (Kuhl, 1820).

Procellaria turtur Kuhl, 1820, Beitr. Zool., p. 143.

(The generic and specific designations of the Prions are at present determined on such insufficient grounds, that the nomenclature must be regarded as tentative.)

The Fairy Prions were first detected by the rays of electric torches as they came in to their retreats beneath the boulders on the talus slopes of Dinghy Cove. Their breeding season was evidently passed when we arrived on January 11th, but the birds returned after dark until the second week in February.

The measurements of birds secured on the island are as follows:—

Sex.	Wing.	Culmen, Length and Breadth.	Tarsus.
1 ♂	174	23 x 11	31
2 ♂	170	23 x 11	30
3 ♂	170	23 x 10·5	31
4 ♂	171	23 x 11	32
5 ♂	175	24 x 11	32
6 ♂	165	23 x 10·5	32
7 ♀	166	23 x 10·5	32
8 ♀	172	23 x 11	32
Average ..	170·3	23·1 x 10·8	31·5

Family PELECANOIDIDAE.

Pelecanoides urinatrix (Gmelin, 1789).

Procellaria urinatrix Gmelin, 1789, Syst. Nat., vol. i., pt. ii., p. 560.

Diving Petrels were seen or heard almost every night during the whole of our stay on the island. They came into Dinghy Cove after dark and usually made direct for the spaces beneath and between the boulders of the talus slope, but many birds were found among the bracken at the cliff edge. The breeding season was evidently over at the time of our visit; but one dead, downy chick and one addled egg were found in the deep interstices beneath the boulders. The birds uttered a low-pitched, mewing call (key of F minor) and, unlike the Prions, are not confused by a beam of light.

The measurements of birds secured on the island are as follows:—

Sex.	Wing.	Culmen, Length and Breadth.	Tarsus.
1 ♂	121	18·5 x 8	27
2 ♂	125	16 x 8	27
3 ♂	120	17 x 8	26
4 ♀	122	17 x 7·5	25·5
5 ♀	117	17 x 8	27
6 ♀	122	15 x 8	26·5
7 ♀	116	16 x 7·5	25
8 ♀	122	17 x 8	26
9 ♀	120	17 x 7·5	26·5
Average ..	120·5	16·7 x 7·8	26·2

The single egg measured 38 x 31.

Family CHARADRIIDAE.

Charadrius ruficapillus Temminck, 1822.

Charadrius ruficapillus Temminck, 1822, Pl. col., 8, pl. 47, fig. 2.

Two adult Red-capped Dotterels were seen with a young bird evidently hatched on the island.

(A specimen was preserved for purposes of identification Nat. Mus. Coll.)

Family FALCONIDAE.

Falco peregrinus Tunstall, 1771.

Falco peregrinus Tunstall, 1771, Ornit. Brit., i.

A single pair of Peregrine Falcons was seen some time before the abandoned eyrie was discovered on a rock ledge in the cliff to the east of Cairn 2.

Falco cenchroides (Vigors and Horsfield, 1827).

Falco cenchroides Vigors and Horsfield, 1827, Trans. Linn. Soc., xv., p. 183.

A pair of Kestrels had their nest in a small cave high up the cliff to the north of Square Reef. The birds were generally to be seen about the cliffs though they rarely flew over the island plateau.

CIRCUS APPROXIMANS Peale, 1848.

Circus approximans Peale, 1848, U.S.A. Explor. Exped., viii., p. 64.

Some three or four pairs of Swamp Harriers are permanent residents on the island and on January 11th three nests were found containing fully-fledged young birds. The nests consist of an untidy heap of thistle and bracken with rabbit and mutton bird bones strewn around the edge. The Harrier preys largely upon young rabbits and, during the breeding season, takes toll of the mutton birds.

Family HIRUNDINIDAE.

HIRUNDO NEOXENA Gould, 1842.

Hirundo neoxena Gould, 1842, Birds of Aust., Pt. 9, ii., pl. 13.

Several nests of the Welcome Swallow were found on the walls of Guano Cave. One nest was apparently in process of reconstruction, and the birds were occasionally seen over the island plateau.

Family EPHTHIANURIDAE.

EPHTHIANURA ALBIFRONS (Jardine and Selby, 1828).

Acanthiza albifrons Jard. and Selby, 1928, Illus. Orn., ii., pl. 56.

White-fronted Chats were abundant among the thistles and bracken on the island plateau. No nests were found, but many immature birds were present. A specimen was preserved for identification (Nat. Mus. Coll.).

Family MOTACILLIDAE.

ANTHUS AUSTRALIS Vieillot, 1818.

Anthus australis Vieillot, 1818, Nouv. Dict. d'Hist. Nat., xxvi., p. 501.

Pipits were to be seen everywhere over the grassed area of the island. Three nests were found, two with eggs and one with newly-hatched chicks. A specimen was preserved for identification (Nat. Mus. Coll.).

(B) Introduced species nesting on the Island.

House sparrows and starlings were nesting in holes on the cliff face. Neither species is very abundant, and the birds were more often seen on the cliffs and shore platforms than on the top of the island.

(C) Non-resident birds observed.

The following marine species were noted in the vicinity of the island:—*Sula serrator* Gray; *Larus novae-hollandiae* Stephens; *Diomedia cauta Gould.* As occasional visitors to rock pools, *Demigretta sacra* (Gmelin) and *Notophoyx novae-hollandiae* (Lath.) were noted.

Appendix.

Stomach Contents of Tubinares Identified by H. M. Hale, South Australian Museum.

Whole stomachs and samples of stomach contents of birds captured on their homecoming flight (when the food is more or less undigested) were preserved and forwarded to Mr. Hale. His report is as follows:—

Puffinus tenuirostris—

(1) Stomach.—Packed with Mysids fairly well digested (mature form); about 50 Phoronomids; one *Megalopa*.

(2) Stomach Contents.—Great numbers of Mysids (*Leptomysis* sp.).

Pachyptila turtur—

(3) Stomach.—Mainly Mysids, apparently a different species from above (1 and 2); several Amphipods (probably Gammarids, but identification very uncertain). Five *Megalopas* of different species of crab than above (1).

(4) Stomach Contents.—Thirteen Phoronomids; sixteen *Megalopas* of some large crab.

Pelecanoides urinatrix—

(5) Stomach Contents.—Remains of four small fishes, possibly juvenile Carangids, which commonly congregate under Medusae at the period of year when bird was collected; a second species of fish is represented by a fragment of the head. Two Phoronomids of the same species as (4).

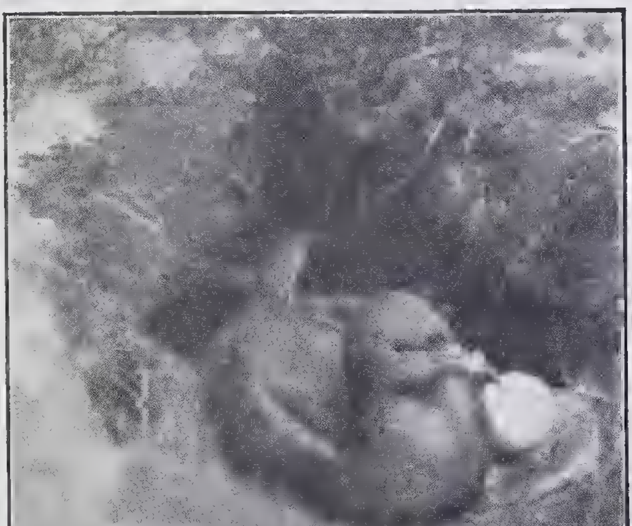
Birds.

Explanation of Plates, XXV., XXVI.

Plate XXV.—Fig. 1. *Eudyptula minor* (Forster). Birds ascending the track at Seal Bay. (Flashlight photo.)

Fig. 2. *Puffinus tenuirostris* Temminck. Bird and egg in excavated burrow.

Plate XXVI.—Fig. 1. *Pelicanoides urinatrix* Gmelin.



Penguins and Mutton Bird.

1.

2.

Petrel and Seals on Lady Julia Percy Island.

24. *Mammalia.*

By J. A. TUBB and C. W. BRAZENOR.

Order CETACEA.

Suborder MYSTACOCETI.

Family BALAENIDAE.

On two occasions large whales were seen off the southern end of the island. They were probably the Blue Whale, *Balaenoptera musculus* (Linnaeus, 1758).

Suborder ODONTOCETI.

Family DELPHINIDAE.

DELPHINUS DELPHIS Linnaeus, 1758.

Delphinus delphis Linnaeus, 1758, Syst. Nat., ed. 10, p. 77.

On February 2nd a school of about 24 dolphins was observed off the north coast of the island, travelling east. They were joined by seals from the island colonies who amicably escorted them along the coast.

Order CARNIVORA.

Suborder PINNIPEDIA.

Family OTARIIDAE.

ARCTOCEPHALUS TASMANICUS (Lord and Scott, 1925).

Arctocephalus tasmanicus Lord and Scott, 1925, Pap. and Proc. Roy. Soc. Tas., p. 187, pls. xvi.-xxi.

Between three and four thousand seals inhabit the caves and rocky beaches of Lady Julia Percy Island. Owing to the numerous shore platforms and beaches the western coast is most thickly populated, but Seal Bay on the south coast, and a cave and platform on the east coast of Cape Frederic, also support large colonies.

Aged bulls attain a length of about eight feet, and females are about five feet from nose to tail. A group of seals often shows great variation in colour, but this is almost entirely due to the degree of wetness of the fur. On emerging from the water they appear almost black, but the hue becomes lighter as the fur dries. When quite dry the adults are yellowish-brown, both above and below, though some females show lighter coloration, with patches of greyish-white on the throat, nape, and saddle. One abnormal specimen, pale grey on the back, and pure white below, was noted.

Skulls of aged males possess a well-developed saggital crest. This is absent in all females and younger males. The post-orbital malar processes are large and, when viewed from a ventral aspect, curve well into the zygomatic area. They do not differ in any respect from the skulls of typical *A. tasmanicus.*

At the time of the Society's visit, upwards of a thousand pups, only a few weeks old, and about two feet long, were present. These were a uniform chocolate colour above and below. They sunned themselves on the beaches and played in the rock pools, but did not venture into open water.

It has been noted by sealers and others that fur seal communities are divided into groups. Each of the older bulls is reputed to possess a "harem" of females, which he allows no other bull to approach. This may be true during the breeding season, but at the time of our visit it was certainly not the case. Pups, females, and bulls of varying ages lay together on the rocks, and though fighting frequently took place, its usual cause was an attempt by one animal to usurp a particularly smooth and sunny place occupied by another. When fighting the animals stand breast to breast with noses pointing upwards. The teeth are used in a quick slashing blow, sometimes repeated, and the battle is accompanied by grunts and roars. Most often sheer weight appears to be the deciding factor.

It was possible, by exercising care, to approach quite close to the seals, but a sudden movement or a loud noise caused them to take to the water immediately. When disturbed, adult animals progress by using fore and hind limbs alternately in a clumsy lope, but when unhurried a modified quadrupedal action is sometimes used.

The animal performs its toilet with the pes, and the extremities of the toes can be folded inwards exposing the nails. These are used as a comb with a pushing action, the sole of the foot being uppermost.

The noise emanating from a seal colony is loud and incessant. The call of the bull is a hoarse, coughing roar; that of the cow is more highly pitched, and the bleating of the pups is reminiscent of domestic sheep. In calling, the nose is pointed in the air.

Breeding was over before the Society's visit, but local reports gave the pupping season as in early December; pups varied considerably in size so that it would appear to extend over several weeks. No case of twins was observed. Small pups were suckled on the shore, but larger pups were sometimes seen suckling in the water.

The acrobatics of the animals in the surf and in the fringe of kelp in more sheltered bays were amazing and entertaining. A favourite position, possibly when searching for food, was one in which the whole body except the hind flippers was vertically submerged. One seal was observed to remain in this position for three and a half minutes before coming up to breathe. The seals fed in the late afternoon. Excreta and debris on the beach suggested that barracouta formed the principal food, with parrot fish, squid and crabs as supplementary items.

The stomachs of a number of young and adult animals were examined for food contents and parasites. One adult contained a small number of parrot fish bones, the remainder being empty of food. Small pebbles, from ¼ to ½ inch in diameter, were found near the pyloric end of the stomachs of the pups. Three animals contained 4, 7 and 8 respectively.

All adults were infested with large numbers of intestinal parasites. Round worms were found in the stomach, and tape worms in the caecum and large intestine. A parasitic mite was found in the posterior nasal passage of all seals including young pups, and a thread worm was discovered in fatty tissue underlying the skin of one animal.

Order RODENTIA.

Suborder DUPLICIDENTA.

Family LEPORIDAE.

Genus ORYCTOLAGUS.

ORYCTOLAGUS CUNICULUS (Linnaeus, 1758).

Lepus cuniculus Linnaeus, Syst. Nat., ed. 10, p. 57.

A pair of agouti coloured rabbits was liberated on the island in 1868. It is now heavily populated, and similar colour forms to those on the mainland occur. A large number of the grey form have small patches of white on the head and feet. The population no doubt fluctuates with good and bad seasons, but in December, 1935, 850 pairs were taken by trappers.

Seals.

Explanation of Plate, XXVI.

Plate XXVI.—Fig. 2. *Arctocephalus tasmanicus* Lord and Scott. Females and young on a shingle beach, Cape Frederic.